The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 124, NO. 15 — CHICAGO, ILLINOIS — APRIL 8, 1944

COPYRIGHT, 1944, BY AMERICAN MEDICAL ASSOCIATION

THE DIFFICULTY OF EVALUATING DRUG TREATMENT IN SURGICAL INFECTIONS

FRANK LAMONT MELENEY, M.D.

Associate Professor of Clinical Surgery, Columbia University College of Physicians and Surgeons

NEW YORK

The sulfonamides have been called the "miracle" drugs, and it is true that certain infections respond dramatically to their use. However, one finds that there are many conditions in which they cannot perform miracles and where their benefit is questionable. In fact, many cases have been reported of disastrous effects. Now penicillin comes to the fore and is called the "wonder" drug. To what limits are these new agents "miracle" or "wonder" drugs? What is the basis for these popular enthusiasms? To what degree are these misconceptions in the minds of the members of the medical profession? Are our own medical reports at fault? These questions need answers.

We have now had five or six years' experience with the sulfonamide drugs in various types of infections, and it ought to be possible to outline their indications and limitations.

The unquestioned value of sulfanilamide was clearly proved when hemolytic streptococcus meningitis responded to its use, because formerly that infection was almost invariably fatal. Furthermore, not only did hemolytic streptococcus septicemia, with a former mortality ranging around 50 per cent, show a significant drop in this figure, but the disease itself virtually disappeared from our hospitals. That is an established fact which is generally recognized.

It was inevitable that sulfanilamide should be used in all other kinds of infections as soon as its relative safety, cheapness and availability had been demonstrated. However, it was not long before sulfanilamide was being used indiscriminately by doctors and even by patients themselves with or without the advice of corner druggists or well meaning friends. It was then found that it was not the panacea that it had been thought to be but had a selective action for certain types of bacteria. The necessity for determining the bacterial nature of every infection then became apparent, and yet we still find doctors using the therapeutic test and not only running the risk of toxicity but losing the opportunity for prompt, specific treatment which might be instituted by an exact knowledge of the bacterial etiology of the infection in hand. The same thing is true for the other sulfonamides.

In the last five years many reports have appeared in the literature purporting to show the value of the newer chemotherapeutic agents in all kinds of infections, but few of these reports have included observations of controls. In some of these reports individual cases have been described in which it seemed to the observer that the drug accomplished something which would not have been achieved without the drug. The only control was the previous treatment of the case itself. In other papers the results in a series of cases have been compared with the author's previous experience. But in most instances the controls have not been run parallel with the treated cases under the same conditions.

It would seem obvious that a series of cases under careful management and close observation cannot be compared with another series in a previous period of time not carefully studied and not under the same conditions of management. Furthermore, many other factors come into play year after year which materially serve to lessen the incidence or shorten the course of infection. For examples I need mention only such devices as the Miller-Abbott tube in peritonitis, the steadily increasing knowledge of the importance of electrolyte and protein balance and nutrition in combating infection. The seasonal variations from month to month or year to year in the virulence of organisms is too well known to warrant more than a reminder.

Many of the favorable reports of the action of the sulfonamide drugs, for example, have dealt with medical infections. In surgical infections which have in the past responded in a measure to the surgical procedure the results of an associated drug therapy have perhaps been more open to question, and it is with these that I wish to deal in this paper. Let me first point out some important differences between surgical infections and medical infections.

A COMPARISON OF "MEDICAL" AND "SURGICAL" INFECTIONS

1. Infections are considered surgical if they can be controlled by an operative procedure. Surgical infections are usually characterized either by a localized breakdown of tissue or by a collection of purulent exudate or are those associated with some kind of a wound. The surgical procedure may be a complete or partial removal of the infected tissue or it may be an incision or an aspiration which drains off or removes the liquified tissue or purulent exudate. A medical infection, on the other hand, is a localized or generalized diffuse cellulitis with little or no breakdown of tissue or little or no gross localized confined exudation of leukocytes.

2. If a patient is to recover from a surgical infection there must usually be either a spontaneous evacuation or a surgical removal of the dead tissue or purulent exudate. If there is an operative procedure there must always be a scar resulting from the healing process. If a patient recovers from a medical infection the involved tissue or organ is restored practically to

normal with little or no gross evidence of scarring of that organ. (When tuberculous lesions break down, they frequently become surgical.)

3. In surgical infections the repair of the wound and the abscess cavity frequently demands greater resources of nutritive elements than for the restoration of tissues in medical infections in which they have not been injured.

4. Surgical infections are caused by the pyogenic or necrotizing organisms, and frequently there is a variety of species taking part in the process. This is particularly true of infected wounds. Medical infections are usually caused by a single organism or virus, although surface infections such as enteritis or colitis may permit the activity of secondary contaminants.

5. The wall of an abscess is made up of necrotic tissues and thrombosed blood vessels which may prevent immune elements or medication in the blood from reaching the focus where the organisms are living and carrying on their metabolic processes. In medical infections patent or even dilated blood vessels course through the inflamed tissue carrying any immune substance or medication which may be present in the blood, and these have a better chance of coming into close contact with the infecting organisms than in surgical infections. Furthermore there is evidence that dead tissue inactivates many of the antibacterial agents which may be applied to surface wounds or reach a focus through the blood stream.

6. On the other hand it should be noted that with surgical infections after recovery there is little evidence that any general immune reactions have developed in the course of the disease. The control of the infection may be accomplished by some "immune" reaction of the local tissues, but there is no evidence of lasting immunity. With many medical infections there is evidence of the development of immune substances which can sometimes be detected in the blood in the early stages of the infection. Frequently they play a critical role in the recovery from the disease and provide a lasting protection against it for the rest of the patient's natural life.

7. Perhaps the most important difference between medical and surgical infections is that the former are not benefited but are made worse by incision while the latter are usually made better. This is probably due primarily to the removal of dead tissue.

And yet in the early stages the surgical inflammation, which later breaks down with necrosis of tissue and purulent exudate, is similar to a medical inflammation. If a drug can be given in the earliest stages of an infection before there has been any breakdown of tissue, it seems obvious that it should have a greater effect than if given after the infection has gained a foothold and has gone on to the necrotizing stage. Obviously also the larger the dose of medicine that can be given within the low limits of toxicity, the more effective it should be. On the other hand the best results to be expected from a surgical procedure are frequently not obtained by the earliest and most extensive operation. It is true that with contaminated accidental wounds or war wounds early surgery is of the greatest importance as a prophylactic measure against infection. However, in spontaneous infections a delay in the operative procedure may be the best treatment, and the proper timing may be more important than the nature of the procedure itself.

If there has been an accidental wound or a war wound (and these wounds are always contaminated by organisms) or if there has been a surgical procedure in a spontaneous infection, the opportunity is given for the local application of the drug to the surface of the wound or infected tissues as well as for the general administration of it, while no such opportunity is offered in medical infection, except for certain involvement of visible mucous membranes such as tonsillitis, conjunctivitis, urethritis or vaginitis.

If we are going to appraise drugs in surgical infections properly, all of these various factors must be weighed and measured. Any drug will alter the normal course of an infection to the extent to which it can slow down, either directly or indirectly, the growth or metabolism or the spread of the causative organism. The sulfonamides and penicillin seem to modify the natural course of certain infections and have no effect on others. We are in the process of finding out what their indications and limitations are, and the problem must be studied carefully and methodically and not with prejudice

How then can drugs be appraised in the treatment of surgical infections? This question must be considered in two categories: prophylactic and therapeutic. Prophylactic treatment may be applied to those conditions which are likely to produce infections. First, the ones of greatest interest at present are the war wounds and burns. Second, and closely similar to these in many respects, are the civilian accidental wounds and burns. A third group consists of operative wounds in contaminated areas, for example operations on the alimentary tract, particularly the esophagus, lower ileum and colon.

PROPHYLACTIC STUDIES

In the prophylactic appraisal of drugs, control series are absolutely essential. One must know the incidence, severity and duration of infection in drug treated cases and in a parallel series treated in exactly the same way without the drug. Differences in percentage of infections between the two series must fulfil the requirements of the formulas of the biostatisticians in order to minimize the possibility of chance being responsible for those differences.

It is essential also that the control series be strictly comparable with the treated series. In order to be certain of this it is necessary to record all the factors in the individual cases which may play a role either in favoring or in minimizing the development of an infection. Then all the cases which present each factor may be grouped together and contrasted with those in which that factor is absent. Within those contrasting groups the controls may then be compared with the treated cases. This is the method of cross tabulation.

For example, in accidental wounds or war wounds important factors which play a role in the development of infection are a short or a long interval of time between the accident and the operation, maximum or minimum gross contamination, maximum or minimum tissue damage and complete or incomplete débridement. In order that the presence or absence of these factors may be recorded in every case which is studied, it is necessary to employ case summary sheets on which these data are listed. To facilitate the analysis of these data, these summary sheets may be so arranged that the data can be transferred to punch cards. Then the incidence, severity and duration of the infection can be readily determined for each group of major factors. While

it is true that many factors will be operating in a given case, by multiple groupings of the cases according to the presence of a common factor as compared with its absence or antithesis, by cross tabulations, some indication may be given of the relative importance of these factors.

The biostatisticians tell us that when there is a multiplicity of factors operating in any given situation the importance of any single factor may be hidden or lost sight of, but if any single factor consistently stands out its importance is thereby demonstrated.

A study of civilian accidental wounds of the soft parts, compound fractures and burns, recently reported,[1] has been going on under the direction of the Subcommittee on Surgical Infections of the National Research Council in seven clinical and laboratory units scattered over the country. An appraisal has been made of the sulfonamides in the form of sulfadiazine for general administration either alone or combined with sulfanilamide or equal parts of sulfanilamide and sulfadiazine locally. From a study of our data we have found no indication that sulfonamides used in this way prevent the development of local infection, although they apparently prevent the general spread of infection and cut down the mortality. Four of the seven units which have carried out this study are now proceeding to the appraisal of penicillin and other promising agents to see if something cannot be found to cut down materially the incidence of infection in these accidental wounds. Similar studies could and should be carried out by investigating units at the front hospitals. Likewise, similar studies should be carried out in a series of contaminated operative wounds.

Let me emphasize again, however, (1) the necessity of having parallel alternating unselected, untreated controls under the same conditions as the treated cases, (2) the necessity for uniformity of study by the use of summary sheets, (3) the grouping of cases with a common factor, (4) the analysis of data by cross tabulations and (5) the application of the criteria of significance required by competent biostatisticians.

In prophylactic studies of wound infection the following factors may play a role either in favoring or in minimizing the incidence of infection, and the appraisal of drug treatment must be considered in the light of these factors and their interplay:

1. First aid treatment before hospital admission.
2. Age and basic nutrition and condition of the patient on admission.
3. Duration of time between injury and hospital admission and operation.
4. Local and general medication before hospital admission and operation.
5. Kind, size, depth and location of the wound.
6. Degree of gross contamination and tissue damage.
7. Nature and extent of bacterial contamination.
8. Method and completeness of excision of damaged tissue.
9. Duration of operation and wound irrigation.
10. Methods of wound repair, drainage and closure.
11. Immobilization of the part and frequency of dressings.
12. Local and general medication during and after operation.
13. Measures used to prevent secondary contamination.

THERAPEUTIC STUDIES

When an attempt is made to appraise the value of drugs in established surgical infections, the problem becomes still more difficult and it must be approached in a somewhat different way. The most important differences between prophylactic treatment and therapeutic treatment are due to the element of time. In prophylactic cases there is a fixed starting point—the moment of the injury in war wounds, the time of the accident in civilian cases, the period of operation on contaminated regions. In established infections the period of time during which the organisms have had a chance to invade the body may vary from a few hours to several years.

This covers the whole range of acute and chronic infections. While there is no sharp line between them, it is profitable to make a distinction between acute and chronic infections because there are certain factors operating in one group and not in the other. For example in acute surgical infections there may be a period in which treatment can be instituted before there is a breakdown of tissue. This gives the best opportunity for a drug to work if it is going to do so. Surgery in many cases has not been done when the patient presents himself for treatment; perhaps it should be delayed pending localization; possibly it may be obviated altogether. On the other hand a chronic surgical infection in most cases has had not one but many forms of treatment, often including several operative procedures, there is already a breakdown of tissue and the chances of drug alone being effective obviating surgical procedure is often remote. Furthermore in acute, spontaneous surgical infections there is usually a single organism operating, while in chronic infections there is usually a host of secondary invaders that must be dealt with. In acute surgical infections the patient is frequently in excellent general physical condition, while in chronic infections the nutritional status of the patient is almost always seriously altered and the blood volume, the red cells, the hemoglobin, the plasma protein and other blood elements may have changed considerably.

For these and other reasons the number of factors in established infections which must be considered are much more numerous than in prophylactic studies. In certain acute surgical infections controls can be studied, but in chronic cases it is much more difficult to line up a control series. One must either (I) let the case itself, in its previous treatment, be the control or (II) show some results in the drug treated cases not previously seen in our surgical experience.

I. Examples of the case itself in its previous course being the control may be briefly illustrated by the following cases:

A. *Acute infections.* 1. A boy with a boil on his leg struck his hip while sliding to third base. That evening his fellows threw him in a lake. At midnight he had a chill followed by fever of 103 F. His blood culture revealed hemolytic Staphylococcus aureus. Sulfathiazole and sulfadiazine for a week failed to affect the course of the disease. Pain and swelling developed in the right buttock. Incision of the buttock abscess was of only temporary benefit. Penicillin was given and his temperature fell in twenty-four hours. Blood culture became sterile but x-ray examination showed progressive destruction of the ilium. All local signs subsided and he was sent to a convalescent home. Fever recurred and a tender mass developed on the inner surface of the ilium. X-ray examination revealed further destruction of the ilium and the sacroiliac joint. Another course of intramuscular penicillin was started and continued for ten days. All symptoms and signs disappeared and did not recur. X-ray examination revealed progressive reconstruction of the bone.

1. Ann. Surg. **118**: 171-186, 1943.

2. A patient with a cellulitis of the face starting with a furuncle of the chin had a spiking daily temperature of 105 and 106 F. The blood culture revealed hemolytic Staphlococcus aureus. The swelling of the face closed the eyes and in the neck caused progressive difficulty in swallowing and breathing. Incisions were made in softened areas. Staphylococcus antitoxin, neoarsphenamine and other drugs failed, and the outlook seemed hopeless. She was then given staphylococcus bacteriophage intravenously in increasing doses, and within twenty-four hours the breathing became easier, swallowing was tolerable, the temperature fell and the blood culture became sterile. In four days it was obvious that she was out of danger.

B. *Chronic infections.* 1. The abdominal wound became infected following a hysterectomy; the infection spread and failed to respond to various antiseptics. Gradually an ulcer formed with undermined margins. Several attempts were made to control the infection by excision of the lesion. The temperature ranged to 101-102 F. daily. Then the ulcer measured 18 by 20 cm., with undermining in all directions 8 to 12 cm. farther. It was finally recognized as a chronic, undermining, burrowing ulcer and yielded on anaerobic culture the microaerophilic hemolytic streptococcus. It was then treated with zinc peroxide suspension. Promptly the fever subsided. The undermined margins began to heal down and it was soon possible to graft the defect successfully. Three days after the zinc peroxide was started, the microaerophilic hemolytic streptococcus was not found in the cultures but in its place a green streptococcus which did not interfere with wound healing.

2. Two years before admission, a patient had had an attack of chills and fever followed by pain in the lower right part of the chest and the right upper quadrant of the abdomen. He was incapacitated for a month and then returned to work but continued to have intermittent pain in the region of the right costal margin radiating to the shoulder and occasionally periods of mild jaundice. The pain increased in severity until three weeks before admission, when malaise developed followed by a severe chill. On examination a large, tender liver was found and a high right diaphragm. The temperature ranged from 99 to 102 F. Liver damage was indicated by function tests, high phosphatase and inverted albumin-globulin ratio. Amebas were found in the stools. A diagnosis of amebic abscess of the liver was made. The patient was put on a course of emetine and iodoxyquinoline sulfonic acid for ten days. The temperature fell in two days. The liver decreased in size. Amebas disappeared from the stools, and the patient remained asymptomatic.

In this brief recital of actual cases there seems to be little doubt about the value of the therapeutic agents. But even such cases must be multiplied many times and the results repeatedly confirmed to rule out the possibility of chance. If, however, in these cases the improvement had been a matter of weeks, or months rather than hours or days, the value of the therapeutic agent would have been questionable. So the time factor must be considered in the evaluation of the drug.

II. Cases showing results not previously seen in our surgical experience may be divided into several groups, as follows:

A. Those in which surgical procedures are obviated entirely.

B. Those in which surgery may be more limited or conservative than usual.

C. Those in which surgery is necessary but in which the healing time is definitely shorter than usual.

D. Those in which surgery is performed but closure of the wound may be safely done either primarily or within a few days.

The goal of the surgeon in his battle against infections is to prevent contaminating organisms from gaining a foothold in the body or to stop promptly the activity of organisms which have already gained a foothold when the case comes under his observation. If this can be done in the early stages before there has been a breakdown, surgery may be obviated. If this can be done by the use of a drug in cases which in our experience always go on to necrosis without the drug, we can be certain that the drug was effective in those cases. It is even more striking if surgery is obviated by the use of drugs after the breakdown has taken place, i. e. if there is a resolution of the inflammatory process and an absorption of localized exudate without the aid of surgery.

A. Infections which in the natural course of events become surgical by virtue of a characteristic local breakdown of tissue or collection of purulent exudate are in the early stages simply diffuse cellulitis of limited extent. The breakdown may come early or late, depending on the variety and virulence of the species of the causative organism and the tissues involved.

Examples of such a course of events may be given in the following brief abstracts:

I. *Acute infections.* (*a*) A boy complained of a sudden onset of chills and fever of 105 F. with pain in the region of the great trochanter of the right hip but was found to have free motion of the joint. The blood culture was positive for hemolytic Staphylococcus aureus and he was given penicillin in large doses intramuscularly. The temperature fell abruptly but the local process remained painful for several days. It gradually subsided, but in the course of time x-ray examination showed some destruction of bone in the region of the great trochanter. This did not spread, however, and gradually the area of destruction was reconstructed without the necessity for surgery, which ordinarily would have been required.

(*b*) A mechanic had a collar button abscess of the hand, with a small superficial blister and a small opening through the skin into a larger cavity beneath the skin. Formerly such a lesion invariably required an incision into the deep cavity. The lesion was caused by a hemolytic Staphylococcus aureus susceptible to a potent bacteriophage, which by simple daily instillations into the deep cavity invoked a local subsidence of the process without the necessity for surgery.

II. *Chronic infections.* (*a*) A woman of middle age had a large ulcer of the leg with a shaggy, pale, granulating base and undermined rolled in skin margins infected with a mixture of hemolytic streptococcus, hemolytic Staphylococcus aureus and Bacillus pyocyaneus. The base was indurated, and the surgeon planned to excise it to get rid of the infection and establish a relatively normal base. Instead the wound was sprayed daily with sodium sulfadiazine powder. Exudate diminished, the smears and cultures showed a rapidly diminishing bacterial flora, first the hemolytic streptococcus disappeared and then the pyocyaneus, and lastly the staphylococcus ceased to be active. The edges sealed down, new epithelium grew in and the wound became amenable to grafting.

(*b*) A bartender struck a drunken patron and sustained a tooth laceration of the back of the hand. A foul smelling infection developed in the course of a few days. Cultures revealed spirochetes, fusiform bacilli and anaerobic streptococci. The first metacarpophalangeal joint was threatened. Daily application of zinc peroxide resulted in a rapid subsidence of the inflammation and disappearance of the organisms. Without this response, invasion of the joint would probably have occurred and amputation would probably have been required.

B. In certain surgical infections past experience has shown that limited incision or excision has been ineffective and it has been necessary to incise beyond the involved area or excise the lesion by a wide margin. It has been found, however, that with the use of certain drugs a more conservative operative procedure may be effective. There is, of course, some difficulty in

judging such cases and in being certain that the procedure is more limited than would otherwise have been necessary. Clearcut examples, however, are found in the following cases:

I. *Acute infection.* A sudden onset of painful swelling of the leg extending to the thigh in forty-eight hours showed the characteristic area of bluish discoloration and bullous formation pathognomonic for hemolytic streptococcus gangrene. This area went on in four or five days to frank gangrene. In the natural course of events it is necessary to make multiple incisions extending up beyond the area of swelling into normal tissues, but in this case the gangrenous area was excised and sulfadiazine was given by mouth. The process came to a standstill with steady and fairly rapid resolution. The skin defect was then covered with a graft.

II. *Chronic infection.* In a typical case of progressive bacterial synergistic gangrene of the skin of the abdominal wall there was a large ulcer with steadily spreading, intensely painful gangrenous margin surounded by a red raised purple zone and outside of that a zone of erythema of varying width. In the natural course of events this process can be stopped only by wide excision of the whole lesion well beyond the zone of erythema. In this case, however, a more limited excision was done at the outer margin of the purple zone followed by the application of zinc peroxide. This controlled the infection, and the favorable effect of the drug as an adjuvant to surgery seemed fairly obvious.

C. In the third group in which surgery is necessary but in which the healing time is definitely shorter than usual, the effect of drug therapy is much more difficult to evaluate and a parallel series of control cases is required to make the demonstration convincing. The time for healing is dependent not only on the control of the infection but on the original extent of the lesion, the amount of tissue injury already done and on many other factors which should be taken into consideration and recorded. Added data to indicate the control of infection are obtained by making a quantitative and qualitative study of the bacterial flora before and at frequent intervals after the surgical procedure, both in cases in which there is an accompanying administration of the drug and in the controls. Cases of this group are abstracted:

I. *Acute infection.* A young man developed a 10 cm. abscess of the anterior portion of the perineum extending up on the scrotum, which on culture yielded a hemolytic Staphylococcus aureus. Through the central opening potent staphylococcus bacteriophage was instilled and a silk drain inserted. There was rapid subsidence of pain, swelling and redness. The drain released copious quantities of pus, and this was the only surgical procedure. The process completely subsided, and the wound was closed in six days.

II. *Chronic infection.* A boy of 14 entered the hospital with a six weeks history of a painful swollen knee. X-ray examination revealed an abscess in the external condyle of the femur. Aspiration of the knee yielded thin fluid; 5,000 units of penicillin was instilled. The joint fluid revealed hemolytic Staphylococcus aureus. Next day the joint swelling was less. The bone cavity was unroofed and the cavity tamponed with China silk and fine gauze packing wet with 5,000 units of penicillin. The packing was renewed and 5,000 units instilled daily. The cavity filled rapidly with granulation tissue and healing was complete. The joint was not opened or aspirated again and returned to normal function.

D. In the last group, in which a primary or early secondary closure is done with the aid of drug in conditions which ordinarily would not permit such procedures, care must be taken in evaluation of the role played by the drug. For some time it has been recognized as a sound procedure to close the wound primarily after the removal of an acutely inflamed or gangrenous appendix but not after a nephrectomy for an abscessed kidney. Some surgeons have advocated and practiced closure of the wound after excision of a gangrenous or suppurative gallbladder. Many have tried it with occasional success immediately after the saucerization of a chronic osteomyelitis. If any large series of these cases is going to be studied to evaluate the use of associated drug, to be convincing it must be studied in conjunction with a series of controls under similar conditions without drug. In this group it should be possible to run a parallel series of controls. Incision into an abscess for the purpose of evacuating pus seldom if ever permits an immediate primary closure of the wound, because besides the freely flowing pus there is usually adherent slough, which has to separate and come away before healing can take place. Any attempt at closure is followed by a breakdown of the wound. If any drug treatment would permit such a primary closure, it would be extraordinary and therefore its value unquestionable. However, secondary closure of such wounds, after the separation of the slough, has been successfully practiced and any convincing evaluation of the role of an associated drug therapy would have to show a significantly shorter time for the interval between incision and closure or a shorter healing time.

In cases permitting early secondary closure an opportunity is given also for a comparison of the rapidity of the diminution or disappearance of the organisms involved in the infection in drug treated cases and in controls. It is probable that this should be the criterion by which to determine the safe and proper time for closure. An illustrative case follows:

A subacute infection. A young cadet on a transatlantic steamer scratched his left index finger while cleaning an engine head. An indolent infection developed, with gangrene of the skin on the radial side of the distal phalanx. It smoldered for a month, gradually spreading. Then an area of gangrene appeared on the dorsum of the first interphalangeal knuckle, exposing the tendon and joint. The infection dissolved the extensor tendon and the first interphalangeal joint. The proximal phalanx and hand became swollen red, and tender. The temperature rose to 104 F. Cultures yielded both the hemolytic streptococcus and Staphylococcus aureus but no anaerobes. The patient was given penicillin generally and locally. The finger was amputated, the distal two phalanges being removed, a long anterior flap being left. Stitches were placed for delayed primary closure, which was done three days after the amputation, when the cultures showed only a few staphylococci. General penicillin being continued for ten days, the wound healed without any clinical evidence of infection.

In established surgical infections the following factors may play a role in maintaining or resolving the infection, and any appraisal of drug treatment must be made in the light of these factors. There are some differences between acute and chronic infections as indicated.

1. Diagnosis of infection, serious or trivial, and location of lesion (acute and chronic).

2. Duration of illness in hours or days (acute) or months or years (chronic).

3. Surgical procedures before admission (chronic chiefly).

4. Local and general treatment previous to admission (acute), with the dates and results of each (chronic).

5. Aerobic and anaerobic bacterial cultures of the blood (acute) and the lesion (acute and chronic).

6. Complete blood count (acute) as well as blood volume and blood chemistry (chronic).

7. Temperature studies (acute and chronic).

8. Primary and secondary local and systemic drug treatment (acute and chronic).

9. Primary surgical treatment (if any) and its relationship to the onset of infection and the beginning of drug therapy (acute and chronic).

10. Quantitative and qualitative bacterial studies of blood (acute) and lesion (acute and chronic) twice a week.

RECORDING RESULTS

In estimating the results of drug therapy in surgical cases it is obvious that we cannot use such simple terms as "recovered" or "died," because there may be clear evidence of benefit from the drug and yet death from the operation or from the disease itself. In some cases death may ensue before there is certainty with regard to benefit from the drug. The appraisal must be made from the point of view of the effect of the drug on the infectious process.

In some cases the result is immediate and surprising —one might almost apply the term "brilliant" or "excellent." In other cases the benefit is definite and reasonably certain but not particularly startling. This might be designated as "good." In many cases the benefit is decidedly questionable. One cannot say that the patient could not have done just as well without the drug; other factors seemed to be more important, the time of recovery was not materially shortened, and so on. The result here must be designated as "questionable." In still other cases it is quite evident that the infection progressed unchanged or went on to a fatal termination in spite of the drug. Here one can say with certainty that there was "no effect."

Any group of investigators working in different places on the same program should follow the same criteria as closely as possible for estimating the results. They should frequently present the data from their own cases to other investigators to check up on their own estimates. This can be done by frequent consultation between the leaders of the different groups.

One would wish to simplify this problem, but it is complicated and it is a mistake to be blind to the inherent difficulties. It is only by recognizing them that we can find a way to overcome them. And they can be overcome by wise planning and diligent effort.

SUMMARY

A. Surgical infections differ materially from medical infections in the following respects:

1. Necrosis of tissue or accumulated purulent exudate is present in surgical infections in contrast to the diffuse cellulitis of medical infections.

2. The dead tissue must be removed or evacuated or absorbed and replaced by scar tissue in surgical infections while inflamed tissue without necrosis returns to normal in medical infections.

3. There is frequently a mixture of organisms in surgical infections in contrast to a single species or virus in medical infections.

4. Necrotic tissue and thrombosed blood vessels prevent certain elements in the blood and medication from reaching the focus in surgical infections in contrast to patent and perhaps dilated blood vessels permitting the inflow of blood elements and medication into medical infections.

5. There is only local (if any) immunity in surgical infections in contrast to general immunity, which may hasten recovery, in many medical infections.

6. Necrotic tissue and pus in surgical infections may inactivate or inhibit certain medications which may be very effective in medical infections.

7. Incision usually benefits surgical infections, while it does positive harm to medical infections. Incision in surgical infections must be properly timed to do the least harm and the most good.

8. Surgical infections, being local, permit the local as well as the general use of drugs, while medical infections usually permit only their general employment. (Exceptions to this are such surface infections as erysipelas, tonsillitis or meningitis.)

B. For the foregoing reasons the evaluation of drug therapy in surgical infections is infinitely more difficult than in medical infections.

C. Drug administration in surgical infections may be prophylactic or therapeutic.

1. The prophylactic use of drugs is possible in war wounds, in contaminated accidental wounds of the soft parts, in compound fractures and burns in civilians and in operations on contaminated regions of the body, such as the alimentary canal.

2. In order to evaluate drugs properly in these cases there must be a comparison of drug treated cases with non-drug treated controls. These controls must alternate with treated cases without any selection of cases. This group presents a fixed starting point.

3. The appraisal of the therapeutic value of drugs in established surgical infections is much more difficult because there is no fixed starting point. The infection may have begun weeks, months or years before the drug treatment is started, during which time it may have had all kinds of treatment, any number of secondary contaminations, profound alterations in blood chemistry, in the nutritional status and in morale. It is difficult to run a parallel control series.

(*a*) In established infections the control may have to be the previous course of the case itself.

(*b*) However, if it can be shown that drug treatment obviates the necessity for surgery or makes possible a more conservative procedure or shortens the healing time or permits primary closure or early secondary closure which would not have been possible without the drug, its value may be demonstrated.

D. All these facts indicate the difficulty of evaluating drugs in the treatment of surgical infections. A carefully laid out plan should be followed and a number of different investigators in different cities should study the problem in a uniform manner, comparing and pooling their results.

E. Results of drug therapy in surgical infections may be designated by the terms (*a*) brilliant, (*b*) good, (*c*) questionable and (*d*) with no effect.

F. In the prophylactic studies, and in established infections when controls are used, the results in treated cases must be significantly better statistically than the controls before the benefit can be certainly attributed to drug treatment. When controls are not used the results must be repeatedly and consistently "brilliant" or "good" in a large series of cases before the benefit of drug treatment can be considered clearly proved.

THE GUILLOTINE AMPUTATION

MAJOR GENERAL NORMAN T. KIRK
SURGEON GENERAL, UNITED STATES ARMY
AND
LIEUTENANT COLONEL FRANCIS M. McKEEVER
MEDICAL CORPS, ARMY OF THE UNITED STATES

Drainage of infected or potentially infected tissues has always been a fundamentally sound surgical principle. Deviations from this basic principle, although occasionally resulting in a sensationally short period of convalescence, most often prolong recovery, endanger survival or result in death. The occasional success of a procedure which is a violation of sound principle does not justify the procedure in surgery any more than does the prosperity of one undetected criminal justify crime.

The guillotine or open amputation is an operation based on the sound surgical principle of drainage for infection. The efficacy of the guillotine amputation as a life saving measure and a "length preserving" operation was definitely established in the World War of 1914-1918. So lethal were the consequences of primary closure of battle wounds that it was necessary for the Surgeon General of the American Expeditionary Forces to issue an order prohibiting the closure by primary suture of any battle wound.

Experience to date in World War II indicates that the sulfonamide drugs have not altered the basic surgical principle of "drainage for infection." Closed amputations of extremities traumatized beyond repair is dangerous to life and wasteful of useful functional bone length even though the sulfonamides are used systemically and topically. This does not mean that these valuable drugs should be discarded. On the contrary, the sulfonamides should be employed routinely along with sound surgery. Critical observation of penicillin indicates that more should not be expected from its use. If the basic principles of sound surgery are ignored, penicillin therapy cannot be expected to be effective.

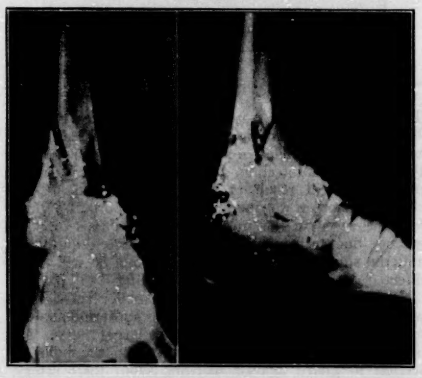

Fig. 1.—Anteroposterior and lateral views of severely infected shotgun fracture of ankle, with gangrene of foot.

This paper, in a symposium on "Amputations," is published under the auspices of the Section on Orthopedic Surgery.

Colonel MacFarlane,[1] the consulting surgeon to the Canadian Overseas Force, in commenting on the results of chemotherapy in the African campaign of 1941 emphasized the necessity for drainage in traumatic wounds. He stated that despite the liberal use of the sulfonamides the battle casualties from this campaign invariably were severely infected when closure of wounds was carried out. He also stated that patients whose wounds were left open and permitted to drain and heal by granulation recovered more quickly and with fewer fatalities.

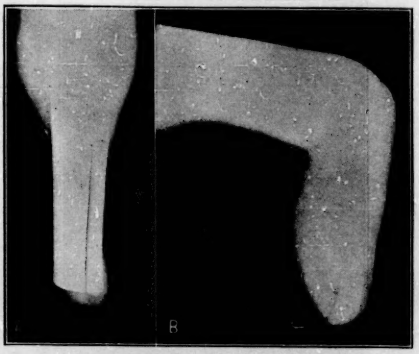

Fig. 2.—Appearance of (*A*) stump six weeks after guillotine amputation: bone ends clean, soft tissue healed over end of bone; (*B*) final result, three months after injury: a reamputation has been performed at site of election eight weeks after guillotine amputation.

The same may be said of our own casualties returned to this country. In one group of 150 amputees, which included patients from all theaters of operation as well as the zone of the interior, the following facts were evident: 1. The systemic status of the patients whose amputated extremities had been left open was universally excellent. 2. The only patients showing the exhaustion of prolonged infection were those in whom the development of infection made imperative the opening of a previously sutured stump. 3. The guillotined extremities all presented a good granulating surface, which was easily and in a short time prepared for closure. 4. The only severely infected stumps were those in which closure was attempted and failed. Their preparation for ultimate closure took longer than the preparation of those extremities which had been left open to granulate. 5. In no instance was the closure of a properly managed guillotine stump complicated by severe infection, nor did it require lavish sacrifice of length.

The guillotine amputation is definitely indicated for any extremity which requires removal when infection is already established or in which the probabilites of contamination make the chances for primary healing questionable. Thus it is the operation of election for an extremity which must be removed because of a severe joint infection or an infected compound fracture or for a severely traumatized extremity in which amputation becomes necessary because of injury to the

1. MacFarlane, J. A.: Wounds in Modern War, J. Bone & Joint Surg. **24**:739 (Oct.) 1942.

circulation or soft tissues. The guillotine operation is also to be chosen when operating conditions are not adequate. The patient recovering from severe shock will tolerate a guillotine amputation, as it can be performed much more rapidly than a closed amputation and with less additional shock.

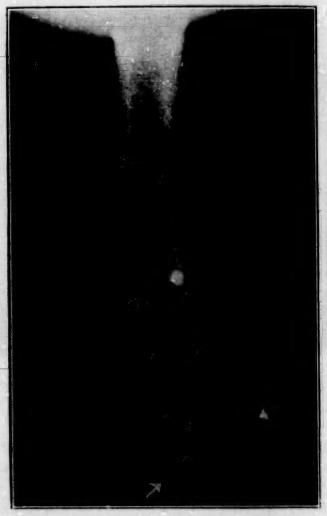

Fig. 3.—Guillotine stump four months after amputation, showing sequestrum and infected osteophytes due to improper handling of periosteum at operation.

Fig. 4.—Thigh stump without traction four weeks after operation: skin receded from bone end.

The guillotine amputation is a two stage procedure. The first stage is the removal of the damaged portion of the extremity. After the open cross section resulting from this stage has healed by granulation and scar contracture, the second stage consists in the operative procedure to produce the final stump for a prosthesis. This may be a simple plastic closure or it may be a reamputation at the site of election.

The technic of the first stage or of the actual removal of the undesirable portion of the extremity is aimed at producing a slightly concave open cross section of the extremity, with the skin slightly longer than the superficial muscle, the deep muscle slightly shorter than its overlying muscle. A circular incision is made through the skin at the lowest level compatible with viable tissue, and the skin is allowed to retract; the fascia is then incised in a circular manner at the level to which the skin has retracted. The superficial layer of muscle is then cut at the end of the fascia and permitted to retract. At its point of retraction the deep layers of muscle are cut through to the bone. After the deep muscles have retracted, the periosteum of the bone is cleanly incised and the bone sawed through flush with the muscles.

Fig. 5.—Below knee stump two months after operation; no traction used: skin receding and bone protruding.

The bone end is not treated by the aperiosteal technic. No cuff of periosteum is removed as in a closed amputation. Bone denuded of periosteum will sequestrate in the presence of infection, and the removal of a cuff of periosteum will result in a ring sequestrum. Clean sharp incision of the periosteum is important. Bone left uncovered in the stump by elevated tags of periosteum due to rough handling will also sequestrate, and the shreds of periosteum in the muscle will cause infected osteophytes which delay healing.

Large vessels are transfixed and smaller vessels tied with plain catgut. The nerves are cut short and allowed to retract into fascial planes. The larger nerves are ligated with plain gut just proximal to the point of section to guard against bleeding from their artery. The entire cross section of the extremity is left open.

For a compound fracture or for an infected fracture, the site of amputation is at the site of fracture. The incision does not always have to be transverse to the long axis of the leg but may be altered to meet circumstances. If necessary to preserve length, the incision may be at a diagonal to the long axis of the leg or racket shaped. For example, to perform the guillotine amputation for an infected compound fracture just

above the ankle joint and an osteomyelitis extending through the entire shaft of the fibula with draining sinuses, a circular incision could be made just above the ankle and extended longitudinally up the lateral side of the leg to permit removal of the entire fibula and drainage of the infected tissue. This would save a below the knee stump with a functioning knee joint. Any attempt to perform a closed amputation in these circumstances would demand a midthigh amputation with greatly increased disability.

For no surgical procedure is the proper postoperative care more important than for the first stage of the guillotine amputation. Skin traction is absolutely essential after the operation. It must be applied immediately and kept up continuously. This in no way interferes with dressing the infected wound. The traction can be released for dressings. When traction is applied immediately after operation the potentialities of the concave

Fig. 6.—Thigh stump six weeks after operation. Skin traction continuously since guillotine amputation. Skin healed by scar. Bone covered. Ready for simple plastic closure.

cross section of the extremity are fully developed. The skin, owing to its elasticity, is gradually pulled down over the muscles, the end of the bone becomes covered by granulation tissue and the skin margin closed by scar contracture.

If skin traction is not continuously applied, the concave cross section of the leg becomes a greatly exaggerated convex cross section, with an inch or two of uncovered bone protruding and a large collar of granulation tissue intervening between the constantly receding skin margin and the bare bone. Such a neglected stump requires a reamputation at a higher site, with unwarranted sacrifice of ultimate length.

The second phase in preparing the open amputation for use of a prosthesis consists in an operative procedure to cover the end of the bone with healthy pliable skin, which has good circulation and normal sensation. This closure is usually a simple matter. When there is an area of clean granulation tissue covering the bone end, when there is no redness or edema of the skin margins and when bacteriologic studies show a low bacterial count, particularly of streptococci, the tissues will tolerate a surgical closure. These conditions can usually be brought about by careful postoperative care in six to eight weeks following the first operation. Prior to performing the operation for closure, roentgenograms of

Fig. 7.—Below knee stump eighteen months after pedicle skin graft. Ulcer throughout graft. Patient has never been able to use prosthesis.

the bone end should be obtained to determine whether sequestration of bone is occurring. If a sequestrum is forming, closure should be delayed and the sequestrum removed at the proper time.

Closure is usually a simple procedure. The scar is excised *en bloc* to good skin, the skin undermined to mobilize it and sutured over the end of the bone. If the scar is so firmly attached to the bone that cutting it loose would leave a projecting piece of bone under the

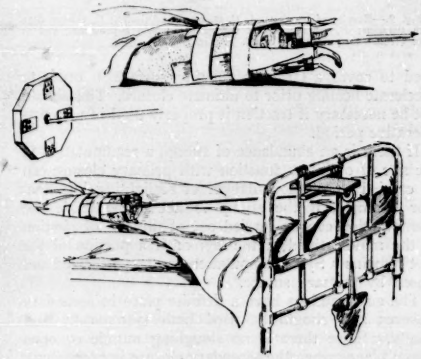

Fig. 8.—Diagram of method of applying traction to open stump (from "Amputations," by N. T. Kirk).

closed skin, a thin section of bone may be removed *en masse* with the scar, by sawing a piece ⅛ to ¼ inch in length from the end of the bone. It is not necessary to free the muscles and fascia from the bone and resuture them over the end. They are already firmly attached and will carry out their function well. The

great longitudinal elasticity of the skin makes possible a definite gain in length of the flaps. Occasionally a plastic section of the skin has to be done after mobilizing it thoroughly to cover the stump end. This can be done without danger of losing skin if the mobilized flap is given a broad enough base for blood supply. Skin traction may also be used advantageously after the plastic closure and be employed until healing results if there is any evidence of tension. This technic enables closure to be effected without additional sacrifice of length when there is no abundance of stump.

Skin grafts, even of the pedicle type, are of little value in effecting closure of the open amputation stump. Because of the avascularity of the stump end, the pedicle is usually lost. If successfully attached, the imperfect sensation and small vascular margin of safety of the flap will not tolerate the trauma of wearing a prosthesis. The pedicle blisters and ulcerates under the pressure of the artificial limb bucket. Repeated invalidism and ultimate reamputation at the request of the amputee is the final outcome. Rarely a pedicle graft may be necessary to save enough of the forearm stump and avoid sacrificing the elbow. The wear and tear of an arm prosthesis is much less than that of a weight bearing artificial limb. Occasionally a split skin graft may be

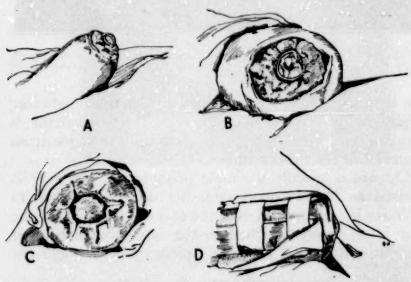

Fig. 9.—Results of traction: *A*, *B*, stump on admission; *C*, sixteen days with traction; *D*, traction straps turned back; skin approaching end of bone (from "Amputations," by N. T. Kirk).

used to cover a large granulating surface in order to accelerate healing prior to ultimate closure. This should not be necessary if traction is properly used in the postoperative period.

If there is an abundance of stump, a reamputation at the site of optimum function with primary closure can be carried out without danger of realighting infection. For example, if the stump is above the ankle the reamputation can be carried out at the site of election in the middle third of the leg, or if a portion of the foot remains a Symes amputation can be performed and closed by primary suture.

The sulfonamides have a definite place in secondary closures and should be used both systemically and locally. Since there is no sloughing muscle or open fascial planes when the secondary closure is carried out, they have less unfavorable factors to overcome and are more effective. Their use permits earlier closure under these circumstances than was possible prior to their advent.

SUMMARY

1. Closed amputations are dangerous to life and wasteful of stump length in the presence of established infection or potentially infected extremities.

2. The local and systemic use of sulfonamide drugs has not obviated the dangers from closed amputations in the presence of infections.

3. The open or guillotine amputation is definitely indicated if the possibility of infection is present. Its use in the presence of infection will save life and also useful stump length.

4. The proper after-care of the guillotine amputation is an essential for good results. Continuous skin traction from the time of amputation is imperative if good results are to be obtained. Otherwise, reamputations with resultant loss of bone length will occur.

PAIN AFTER AMPUTATION AND ITS TREATMENT

COMMANDER JAMES C. WHITE (MC), U.S.N.R.

In this discussion of intractable pain which may follow amputation I should like to begin by pointing out how little is known about it, and what an opportunity is awaiting surgeons in the military forces today for gaining a better insight into its mechanism, as well as for devising effective methods of treatment. With the promising start made by Mitchell, Morehouse and Keen [1] in the investigation of painful nerve injuries during the Civil War, it is surprising how little progress was made by our immediate predecessors from 1914 to 1918. Perhaps this was due to the fact that the best neurosurgical minds, like the late Dr. Cushing's, were taken up with the problems of cerebral trauma, and that therefore lesions of peripheral nerves, which cause intense pain, were neglected. With the present broadening of neurosurgical interest to include the sympathetic nervous system and the problems of intractable pain, we should do better. Painful amputation stumps are likely to be the most common of these distressing conditions and are certain to be a major reconstruction problem for years to come.

MECHANISM OF PAIN

Neuromas.—Microscopic examination of an end bulb neuroma shows it to be a branching mass of Schwann cells and proliferating axones embedded in scar tissue. This would seem to be an ideal setup for the production of pain, and it is remarkable that the great majority of neuromas are not painful. Trotter,[2] in his classic essay on "The Insulation of the Nervous System," pointed out that "the general tendency of all forms of sensation yielded by a regenerating nerve to develop a certain resemblance to pain reminds us that regenerating fibers resemble pain fibers in a lack of insulation. It is probable, therefore, that imperfect insulation tends to render all fibers less sensitive than normal,

This paper, in a symposium on "Amputations," is published under the auspices of the Section on Orthopedic Surgery.

From the U. S. Naval Hospital, Chelsea, Mass., and the Neurosurgical Service of the Massachusetts General Hospital, Boston.

Read before the American Academy of Orthopaedic Surgeons at Chicago, Jan. 19, 1943, and before the American Academy of Neurological Surgery at the Percy Jones General Hospital, Battle Creek, Mich., Sept. 18, 1943, with additions.

Lieut. Col. R. Glen Spurling and Major Frank H. Mayfield of the Army Medical Corps, Capt. W. McK. Craig of the Navy Medical Corps and Dr. Mandel Cohen of the Psychiatric Service of the Massachusetts General Hospital assisted in the preparation of this article.

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the United States Navy. The opinions and views set forth are those of the writer and are not to be construed as reflecting the policies of the Navy Department.

1. Mitchell, S. W.; Morehouse, G. R., and Keen, W. W.: Gunshot Wounds and Other Injuries of Nerves, Philadelphia, J. B. Lippincott Company, 1864.

2. Trotter, Wilfred: The Collected Papers of, London, Oxford University Press, 1941.

but more apt when effectually stimulated to respond in an exaggerated explosive way." In a neuroma the naked nerve endings are totally devoid of any insulating myelin. Furthermore, scar tissue in an amputation stump in which these end bulbs are embedded contracts and also reduces the supply of circulating blood. This is particularly true when there has been infection and delayed healing. In recent experiments Lorente de No [3] has shown that a nerve made anoxic fires off repetitive stimuli, which suggests that impaired circulation in a neuroma may be a source of painful impulses.

Why most neuromas should be painless and others the cause of long lasting torture is quite unknown. This cannot be explained entirely on the basis of any idiosyncrasy on the part of the individual patient (such as a low threshold for pain), because in certain individuals with multiple amputations only a single stump will become painful (Livingston [4]). Why is removing the pain-producing neuroma so seldom successful? A new neuroma will form, but sometimes the pain recurs sooner than its peculiar end bulb can be reproduced. This and the fact that more proximal crushing or chemical destruction by infiltrating the nerve trunk with alcohol fails to give relief has forced investigators to predicate a central extension of the pain mechanism. Mitchell, Morehouse and Keen [1] described an ascending neuritis, but numerous examinations of sections of nerves removed during therapeutic neurectomies have failed to show evidence of any histologic alteration. It is therefore far more likely that the central disturbance is due to reflex changes in the spinal or cortical levels, as has been suggested by Livingston [4] and Riddoch.[5]

The Phenomenon of the Phantom Limb.—After amputation most persons are conscious of their absent member. This may be for only a brief period after amputation, and the sensation may not be painful. Usually it disappears when the patient first starts to use his artificial limb. On the other hand, the sensations may become acute torture, so that the victim complains that his fingers are being compressed into the palm of his hand, or that his toes feel as though they were being constricted in a vise. He may even state that a specific pain from which he suffered before amputation persists unchanged in the missing part. Riddoch comments on the fact that "the prevailing posture of the phantom is that of the part at the time of amputation. It is as if the postural model had become frozen when normal stimulation ceased." These sensations are always located in the periphery of the limb, especially in the fingers or toes, where there is the greatest concentration of sensory nerve endings. The missing hand or foot is sometimes felt in its normal position, but at other times it may shift centrally, so that in the case of a total arm amputation the phantom hand may be felt at the elbow or disappear into the shoulder stump. These are the reasons why the phantom phenomenon has been regarded as psychogenic and the patient regarded with suspicion as a psychoneurotic. As Leriche [6] and Livingston [4] have stated, such a diagnosis is frequently incorrect and may therefore prevent adequate therapy.

Probably the primary cause of the phantom sensation is irritation within a neuroma of centrally conducting axones which formerly supplied the missing part. But this does not necessarily continue to be the case, in view of the other peculiar characteristics of the phenomenon mentioned and the fact that these may persist after all the known afferent connections have been severed. Riddoch [5] has given a most convincing argument for believing that the phantom sensation is a projection arising from the postcentral sensory association areas in the cerebral cortex. According to him:

> Stimulation by the processes of healing of the proximal ends of the divided nerves evokes sensations which are projected and interpreted as if the limb were still present. As has been said, they are never quite normal. These paraesthesiae, through simultaneous excitation of the schema underlying tactile localization and shape, are projected and animate the surface or outline model of the absent part. Similarly, irritation of fibers concerned with postural sensibility give rise to impulses which help to keep alive the postural model, so that the phantom is correctly placed and moves with the stump. These sensations, in the absence of pain, are, however, weak, so that, as a rule, only the peripheral segments, the hand or foot, which are most richly endowed with sensory end-organs and fibers, are represented in the phantom. Retention of the phantom is in part due to the abnormal qualities of the tactile and other sensations, in spite of their relative weakness and the antagonistic evidence from visual and other senses. During the stabilizing process of healing of the divided nerves, sensory impulses diminish, and sensations become correspondingly fainter, with the dual result that the phantom is increasingly less obvious in outline and projection of it is defective. In consequence, it gradually approaches the stump, into which it finally disappears and fades away. A new shape of the body is now accepted. In other words, there is no longer a conflict in evidence from the patient's senses. If, however, the phantom is painful, which is usually the result of grossly abnormal conditions in the stump, the phantom may persist indefinitely and retain its original position. Further, the hand and fingers are not only much more obtrusive and clearly defined, but more of the amputated part is represented by it. Voluntary movement is restricted or impossible because of aggravation of pain. When, however, pain in the phantom is successfully abolished by lateral chordotomy or early removal of abnormalities in the stump, the phantom may behave as if it had been painless from the first.

If this concept is correct, the development of a central projection would be expected to take time to become established in the sensory cortex, a point which has been mentioned by Riddoch and recently emphasized by Air Commodore C. P. Symonds.[7]

General Considerations.—Hilton [8] considered pain in the nature of a protective mechanism, but in the amputation stump neuralgias it becomes a destructive mechanism, dangerous to the patient's morale. When pain of this type is allowed to become chronic, the cerebral cortex may become involved in its projection (Riddoch), and in addition the patient usually develops an addiction for morphine. These complications force us to define the ideal time for surgical intervention. Occasionally the pain subsides spontaneously, but more often than not it continues to get worse. I have recently operated on a patient suffering from a phantom foot of eighteen years' duration. A waiting period of over six months in any but the most stable individuals is dangerous because the psychic changes may become irreparable. We are therefore forced to formulate a rational plan of treatment for these patients.

3. Lorente de No, R.: Personal communication to the author.
4. Livingston, W. K.: Pain Mechanisms. A Physiologic Interpretation of Causalgia and Its Related States, New York, Macmillan Company, 1943.
5. Riddoch, G.: Phantom Limbs and Body Shape, Brain **64**: 197-222 (Dec.) 1941.
6. Leriche, R.: La chirurgie de la douleur, Paris, Masson & Cie, 1937.
7. Symonds, C. P.: Personal communication to the author.
8. Hilton, J.: Rest and Pain, ed. 5, London, Bell & Sons, 1892.

With this purpose in mind I should like to begin at the point where all conservative orthopedic, physical therapeutic and neuropsychiatric procedures have been thoroughly tried and have failed.

SURGICAL TREATMENT

In undertaking this type of surgery, principle No. 1 should be to guard these patients against useless and mutilating operations. While working in France in 1927 I remember seeing a French veteran whose case illustrates many of the difficulties in the treatment of post-traumatic pain. A penetrating wound of the hand had led to chronic suppuration, fibrosis and pain. In the intervening ten years he had undergone a long series of operations including amputation above the wrist, resection of painful neuromas and subsequently progressive amputations up the arm which ended with a painful shoulder stump. Periarterial sympathectomy of the subclavian artery and section of the posterior roots of the brachial plexus failed to put an end to his suffering, which was finally terminated through suicide by hanging. At that time little was known about what to do and, equally important, what not to do about a case of this sort, as this tragic story shows. We are learning slowly, and many points are illustrated by this story. In the first place, it is vitally important not to undertake any ineffective procedures. Col. F. M. McKeever [9] has observed that the pain in an amputation stump is usually increased by any operative procedure, even by revision of flaps, where the severed stumps of the major nerves are not even exposed. It is therefore of vital importance to recognize that certain procedures are useless and should never be employed. At a meeting of military neurosurgeons convened by Lieut. Col. R. G. Spurling at the Walter Reed General Hospital in September of last year it was agreed that the list of nonbeneficial and actually harmful procedures should include the following:

1. *Repeated resections of neuromas.*

2. *Neurectomies or interruption of nerve trunks at higher levels.* Livingston [4] has recorded a resection of the brachial plexus in a painful upper arm stump without benefit, and numerous other case reports from the time of Mitchell, Morehouse and Keen [1] are on record which attest its futility. Another variation of this procedure is the transection of a painful nerve trunk with immediate suture to prevent neuroma formation. Leriche [6] describes its use, but without striking results.

3. *Reamputation for the relief of pain.* Reamputation, as emphasized by Leriche [6] and Riddoch,[5] must never be considered, as the pain nearly always recurs in the new stump and usually is made a great deal worse. There is only one exception to this rule: When the stump is badly constructed and a liability on mechanical grounds, a reconstruction may be in order. Such a revision must be done at an early date, however, if it is to have any chance of relieving pain.

4. *Periarterial sympathectomy.* Successful results in minor forms of amputation stump pain by this operation have been recorded by Leriche [6] and Homans.[10] Leriche, however, states that it should not be considered when the neuralgia is severe. It is my personal feeling that the procedure is nonspecific and that its effects are due to the transitory rise in peripheral circulation that results from the increased elimination of heat following any injury to the tissues. Similar effects can be produced more simply by procaine block of the vasoconstrictor nerves or by fever therapy. In this connection it is of particular interest to record the observation made by Major F. H. Mayfield and Capt. J. W. Devine at the Percy Jones General Hospital that soldiers with malaria are relieved of pain from nerve injuries during bouts of fever.

5. *Intrathecal injection of alcohol.* This procedure, proposed by Dogliotti,[11] has been advocated for the relief of painful amputation stumps in the lower extremity. I have seen it work successfully only once out of seven trials. Furthermore, it carries as great a risk of paralyzing the bladder as section of the spinothalamic tract, or even greater. For any patient who has chronic pain and is even a fair surgical risk I should prefer to cut the pain tracts in the spinal cord.

6. *Posterior rhizotomy.* Sectioning the posterior roots of the brachial plexus is a dangerous and mutilating procedure. The widespread and complete anesthesia which results is both annoying and incapacitating to the patient, if he has a useful stump. For this reason, and even more because the anesthetic stump usually continues to be painful, this procedure should never be undertaken. I have seen a man with a painful amputation stump at the shoulder continue to suffer after division of all the posterior spinal roots from the third cervical down through the third thoracic. Riddoch [5] also emphasizes the futility of posterior rhizotomy in these cases and states that he has seen the pain continue after the anterior as well as posterior roots of the brachial plexus have been cut.

Procedures which may be successful include the following:

1. *Single resection of a painful neuroma.* Leriche [6] and also Bailey and Moersch [12] claim that this operation never produces lasting results, as the neuroma invariably recurs. Riddoch,[5] however, in his article on amputation stump pain is less pessimistic. My personal experience leads me to concur with Riddoch that the removal of a palpable painful neuroma is worth a single trial, provided the pain disappears when the neuroma is infiltrated with procaine. It is a minor procedure and is occasionally successful, particularly if performed very early, before the development of a local functional disturbance in the sensory cortex. In excising the neuroma it is well to use the technic suggested by Boldrey [13] and adopted by Lieutenant Colonel Spurling at the Walter Reed General Hospital of burying the end of the nerve in a drill hole made through a neighboring bone, so that the formation of a fresh neuroma will be prevented by the constricting action of newly formed periosteal bone. Both Spurling and I have used this procedure a number of times in the treatment of neuromas from penetrating war wounds, and the results to date have been promising.

2. *Sympathectomy.* When local measures are unsuccessful, the possibilities of treatment by chemical blocking of the sympathetic fibers to the extremity or by

9. McKeever, F. M.: Paper given at meeting of American Academy of Neurological Surgery, Sept. 18, 1943, at Battle Creek, Mich.

10. Homans, J.: Minor Causalgia: A Hyperesthetic Neurovascular Syndrome, New England J. Med. **222:** 870-874 (May 23) 1940.

11. Dogliotti, A. M.: Traitement des syndromes douloureux de la périphérie par l'alcoolisation sub-arachnoidienne des racines postérieures à leur émergence de la moelle épinière, Presse méd. **39:** 1249-1252 (Aug. 22) 1931.

12. Bailey, A. A., and Moersch, F. P.: Phantom Limb, Canad. M. A. J. **45:** 37-42 (July) 1941.

13. Boldrey, E. Edwin: Amputation Neuroma in Nerves Implanted in Bone, Ann. Surg. **118:** 1052-1057 (Dec.) 1943.

ganglionectomy should always be considered. These are the only minor and nonmutilating procedures that offer any likely chance of success. It should be emphasized that there is no convincing evidence that the peripheral sympathetic axones carry any sensory impulses or that somatic sensory fibers run in these trunks to the peripheral blood vessels. Nevertheless, sympathetic block has resulted in a large number of dramatic cures, both of local stump and also of phantom limb pain. It has been my impression that sympathetic paralysis is most likely to benefit patients whose pain is felt in the distal end of an extremity, and particularly when that extremity is habitually cold, cyanotic and clammy. Individuals with chronic vasospasm usually have an emotionally labile disposition and seem to develop unusual complaints after injury, which can the injection should be repeated. Leriche and Homans in particular have found that in the course of a series of injections the pain may be relieved for increasing intervals, until finally it does not recur. If the improvement is only temporary, repeated blocks are not likely to be helpful; but the chances of lasting relief following permanent vasodilatation by ganglionectomy are great.[16] On the other hand, when diagnostic injection of procaine produces clearcut vasodilatation and anhidrosis but does not influence the pain, treatment by sympathectomy need be given no further consideration.

When this relatively innocuous type of surgery cannot be used, the attack must be shifted to the central nervous system. Before recourse to more radical intervention on the spinal cord or brain, all aspects of the problem should be reviewed with a competent neurologist and a neuropsychiatrist. It must be constantly borne in mind that any ineffectual and mutilating procedure, by adding another psychic trauma, will inevitably increase the patient's suffering and loss of morale.

TABLE 1.—*Relief of Local Pain After Amputation by Interruption of Sympathetic Fibers*

Case	Condition	Surgical Procedure	Relief
1. Roger P.	Crush of index finger and amputation associated with cold, clammy hand; pain in hand radiating up inner arm to pectoral region	1. Reamputation of finger 2. Paravertebral procaine block T_1-T_2 3. Cervicothoracic ganglionectomy	None 2 hours Slight recurrence of pain 1 year after operation, on partial recovery of vasoconstriction and sweating
2. Roland L.	Traumatic amputation of index finger associated with cold, sweaty hand	1. Reamputation 2. Paravertebral procaine block T_1-T_2 3. Cervicothoracic ganglionectomy	None Transitory Permanent
3. James B.	Burning pain developing in stump 30 years after thigh amputation; pain present 3½ years	1. Section spinothalamic tract with sensory level at T_{12} * 2. Paravertebral lumbar procaine block 3. Paravertebral lumbar procaine block 4. Paravertebral lumbar procaine block	Relief for 4½ months with recurrence following transurethral prostatectomy Relief for 2 days Relief for 4 weeks Relief at discharge

* Level of analgesia not high enough.

TABLE 2.—*Relief of Local Pain After Amputation by Section of Spinothalamic Tract*

Case	Condition	Level of Analgesia	Relief
4. William D.	Gritti-Stokes amputation for thromboanglitis obliterans, then complained of deep aching pain in stump, 3¼ years' duration	9th thoracic segment	To death, 3½ years later; this patient subsequently developed pain in stump of other leg after a second Gritti-Stokes amputation and painful gangrene of fingers; died after cervical chordotomy on opposite side
5. Nellie T.	Burning pain in stump since thigh amputation for osteomyelitis 8 years before; at other hospitals had had unsuccessful sciatic neurectomy, multiple excisions of neuromas and intrathecal alcohol injection; latter caused bladder disturbances for 1 year	8th thoracic segment	Complete relief at 3 months
6. Emma H.	Midthigh amputation following septic abortion; local pain in stump of 2 years' duration; previous intrathecal alcohol injections had paralyzed bladder without mitigating the pain	10th thoracic segment	Complete relief for over 3 years but has complained of radicular pain at level of laminectomy

often be corrected by restoring a normal circulation. The most valuable reports on this method of treating pain in amputation stumps and causalgia have been published by Leriche,[6] Livingston,[4] Homans[10] and de Takáts.[14] Two other successful cases of relief of intractable pain after traumatic amputation and also a review of the technic of ganglionic injection and resection have been described by White and Smithwick.[15] Cases treated at the Massachusetts General Hospital by injection of procaine and by sympathectomy are summarized in table 1. It is always best to begin with a diagnostic blocking of the paravertebral ganglions with procaine. This is a simple test, and occasionally a single injection will give enduring results. When freedom from pain lasts a number of hours or days,

3. *Section of spinothalamic tract (chordotomy).* Cutting the anterolateral pathway by which the sensation of pain ascends within the spinal cord is in general far more effective than section of posterior spinal roots. Furthermore, it is not followed by numbness or loss of position sense, as all components of sensation except appreciation of pain and temperature are spared. From my personal experience I feel certain that tenderness and burning pain which are localized in the stump itself can be relieved by chordotomy. Three typical cases treated in this fashion are summarized in table 2.

14. Scupham, G. W.; de Takáts, Géza; Van Dellen, T. R., and Jesser, J. H.: Vascular Diseases: Seventh Annual Review, Arch. Int. Med. **68**: 599-660 (Sept.) 1941.

15. White, J. C., and Smithwick, R. H.: The Autonomic Nervous System, Anatomy, Physiology and Surgical Application, ed. 2, New York, Macmillan Company, 1941.

16. In good risk surgical cases operative resection is always to be perferred to attempts at destruction of these structures by paravertebral injection of alcohol. Even in the most expert hands chemical block is not always effective, and complications are more frequent than in resection under direct vision.

In the case of severe pain and other peculiar sensations from a phantom limb, the decision as to whether relief can be obtained by spinothalamic tractotomy becomes most difficult. In the extensive experience of Bailey and Moersch [12] at the Mayo Clinic this operation has failed consistently. Riddoch,[5] however, does not believe that this is necessarily the case; but when pain has been present for a protracted period so that it has been stamped indelibly on the cerebral cortex, no spinal interruption can be counted on to free the patient from the consciousness of his phantom. In the Neurosurgical Service at the Massachusetts General Hospital 3 patients complaining of pain referred to the missing leg have been submitted to spinothalamic tractotomy (table 3). It will be seen that the severe crushing or pinching pains in the phantom foot have been relieved in each instance. In the first patient, whose phantom sensations had been present for eighteen years, it is remarkable that relief from pain should have been so complete. He writes: "No sensation to speak of in the missing leg, but some throbbing at times in the little toe and ankle bone. No movement of the foot or toes. The operation has also eliminated the spasmodic jumping of the stump to almost 100 per cent." The second patient has had a sense of stiffness in his phantom ankle and big toe, but no pain. The third states that he has lost all sense of his phantom, but that when the muscles of his stump contract he is still aware of the cramplike contractions. This is not a sufficiently large series from which to draw definite conclusions, but it does prove that chordotomy can help in certain cases.

TABLE 3.—*Relief of Phantom Limb Pain After Amputation by Section of Spinothalamic Tracts*

Case	Condition	Level of Analgesia	Relief
7. Charles W.	Pain in phantom foot for 18 years following thigh amputation; 2 previous unsuccessful resections of neuromas	Not recorded	At 2¼ years patient remains comfortable, although at times there is slight throbbing sensation in phantom little toe; spasmodic jumping of stump has ceased
8. Arthur N.	Crushing pain in phantom ankle following hip disarticulation for sarcoma 2 months previously	7th thoracic segment	In good condition and free from pain at 27 months, but has had awareness of phantom with some sense of stiffness in foot and big toe
9. Homer A.	Pinching, burning pain in phantom foot 7 months after hip disarticulation	9th thoracic segment	Complete loss of phantom sensations 8 months after chordotomy; still complains of spasmodic jerking of stump with sense of muscle cramp and of mild radiculitis at level of laminectomy incision

So far I have had no opportunity to attempt a high section of the spinothalamic tract for phantom pain in the arm and have been unable to find any successful report of its accomplishment. Yet chordotomy in the upper cervical segments or a tractotomy at the medullary (Schwartz and O'Leary;[17] White[18]) or mesencephalic (Dogliotti;[19] Walker[20]) levels of the brain stem should interrupt the ascending painful impulses from the upper extremity. However, if the pain is a psychic projection from the cortex, no benefit can ensue. On theoretical grounds this mechanism is more likely to be present after amputations of the arm than the leg. It has been pointed out that phantom sensation occurs in the parts which have the greatest concentration of sensory nerve endings and therefore the greatest representation in the cerebral cortex. The cortical area for the hand is many times greater than the corresponding area for the foot.

In our present state of limited knowledge it is wisest to accept the fact that even a perfectly executed chordotomy, which is known to interrupt all forms of peripheral pain, can be counted on to give relief only when the disagreeable sensations are clearly confined to the amputated stump. Surgical intervention could be undertaken much more freely if objective tests could be devised for differentiating peripheral from central pain. It is possible that pain originating in an amputation stump can be identified by diagnostic blocking of its nerves with procaine. To date this method has not been explored, but if a sufferer from pain in a phantom leg should continue to complain after spinal anesthesia, or a phantom arm should still be present after an effective block of the brachial plexus, then it would seem most likely that the sensation is projected from the cerebral cortex.[21]

4. *Resection of sensory cortex.* In certain sufferers from major amputation stump neuralgia we shall be forced to decide whether, in the presence of phantom sensations with evidence of psychic projection of the painful manifestations, we are justified in taking Riddoch's[5] and Leriche's[6] still earlier suggestion and extirpating the postcentral convolution of the cerebral cortex. Riddoch believes that the phenomena of the phantom limb, such as the persistence in the phantom of pain and postural sensations which antedate the amputation, can be explained only on the basis of cortical representation. He has stated that "destruction of the cortical sensory receptive mechanism in the parietal lobe, which is concerned with the development of postural and surface models and with recognition of change, causes immediate abolition of the phantom limb." This theory is corroborated by the case reported by Head and Holmes,[22] in which disappearance of a postamputation phantom foot followed a lesion of the opposite parietal cortex. Mahoney [23] has recently put this theory to the test and carried out resection of the postcentral sensory cortex in a patient with a very disagreeable phantom arm. After two years the result remains a striking success. With lesions which involve

17. Schwartz, H. G., and O'Leary, J. L.: Section of the Spinothalamic Tract in the Medulla with Observations on the Pathway for Pain, Surgery **9**: 183-193 (Feb.) 1941.

18. White, J. C.: Spinothalamic Tractotomy in the Medulla Oblongata: An Operation for the Relief of Intractable Neuralgias of the Occiput, Neck and Shoulder, Arch. Surg. **43**: 113-127 (July) 1941.

19. Dogliotti, A. M.: First Surgical Sections, in Man, of the Lemniscus Lateralis (Pain-Temperature Path) at the Brain Stem, for the Treatment of Rebellious Pain, Anesth. & Analg. **17**: 143-145 (May-June) 1938.

20. Walker, A. E.: Mesencephalic Tractotomy: A Method for the Relief of Unilateral Intractable Pain, Arch. Surg. **44**: 953-962 (May) 1942.

21. In a case reported by Michelsen[20] a depressed parietal fracture with cortical irritation of the postcentral arm area caused pain very similar to that experienced from a disagreeable phantom to radiate down the opposite arm. By infiltrating the brachial plexus I was able to obtain a complete motor and sensory paralysis, yet the pain which seemed to originate in her arm remained unaltered.

22. Head, H., and Holmes, G.: Sensory Disturbances from Cerebral Lesions, Brain **34**: 102-254 (Nov.) 1911.

23. de Gutiérrez-Mahoney, W.: Personal communication to the author.

the corticothalamic connections, as pointed out by Gerstmann [24] and Nielsen,[25] the patient may lose awareness that he possesses portions of the opposite side of his body. This is the antithesis of the phenomenon of the phantom limb and gives additional backing for the surgical ablation of the postcentral convolution of the cerebral cortex. Further evidence in favor of the central representation of long-standing cases of phantom limbs and causalgia is seen in the pain which may be projected to the extremities in patients with tumors or injuries which involve the postcentral sensory areas in the cerebral cortex. Michelsen [26] has reported 5 instances which we have observed in the Neurosurgical Clinic of the Massachusetts General Hospital.

It is obvious that this projected attack on the highest station for sensation in the cortex is too new to permit any definite conclusions to be drawn. But the theory can be tested by turning down a small parietal bone flap under local anesthesia, identifying the motor strip by electrical stimulation and infiltrating the first postcentral convolution with procaine.

5. *Release from states of agitation by frontal lobotomy.* A final possible approach to the problem of the unbearable phantom is the elimination of the sufferer's introspection and self-centered concentration on his condition which is the natural outcome of long-standing intractable pain. Ordinary psychotherapeutic methods alone have not been effective, but on theoretical grounds bilateral frontal lobotomy might accomplish this result, as it has benefited so many of Freeman and Watts's [27] patients suffering from agitated states. A successful operation of this type has been performed by Van Wagenen.[28] This patient had had a series of forty-five operations for chronic osteomyelitis, ending up with an amputation of the leg through the pelvis. He continued to have intractable pain in his phantom limb and was a confirmed morphine addict. In the year that has elapsed since the lobotomy he has recovered from his drug addiction, is able to look after his house and has only rare phantom sensations in his amputated leg, which are no longer a cause for serious concern. Another such operation has recently been performed by Dr. W. J. Mixter at the Massachusetts General Hospital, not for relief of pain, but in a young woman with an agitated depression secondary to a severe rhythmic tremor, probably on a postencephalitic basis. This patient had been studied in the Psychiatric Service by Drs. Stanley Cobb and M. E. Cohen but was referred to the Neurosurgical Service after failure of psychotherapy and two suicidal attempts. The tremor is, of course, still present, but her attitude toward it has changed profoundly, so that she no longer regards it as an insurmountable handicap in facing her friends or working in a war plant.

In conclusion, I wish to restate the fact that the attack on intolerable phantom sensations by resection of sensory cortex or by interruption of the frontal association fibers must be regarded as purely experimental procedures which will require extensive investigation before their therapeutic value can be estimated. At present neither of these operations is to be considered except under pressure of extreme suffering and in a patient who threatens, unless relieved, to deteriorate into hopeless invalidism. If successful, they will open up a new method of surgical intervention for heretofore hopeless situations—conditions which cause so much pain and incapacity that the patients either become neurotic invalids and drug addicts or suicides. Every war has produced a new crop, and it may be possible to learn how to relieve the majority of them before the present conflict is over.

24. Gerstmann, Josef: Problem of Imperception of Disease and of Impaired Body Territories with Organic Lesions: Relation to Body Scheme and Its Disorders, Arch. Neurol. & Psychiat. **48**: 890-913 (Dec.) 1942.

25. Nielsen, J. M.: Disturbances of the Body Scheme: Their Physiological Mechanism, Bull. Los Angeles Neurol. Soc. **3**: 127-135 (Sept.) 1938.

26. Michelsen, J. J.: Subjective Disturbances of the Sense of Pain from Lesions of the Cerebral Cortex, Res. Publ. Assn. Nerv. & Ment. Dis. **23**: 86-99, 1943.

27. Freeman, W., and Watts, J. W.: Psychosurgery: Intelligence, Emotion and Social Behavior Following Prefrontal Lobotomy for Mental Disorders, Springfield, Ill., Charles C Thomas, 1942.

28. Van Wagenen, W. P.: Personal communication to the author.

SUMMARY AND CONCLUSIONS

1. Incapacitating pain after amputation may be due either to irritation of end-bulb neuromas in the stump or, in the case of a phantom limb with persistence of pain and postural sensations, to their projection from the sensory areas of the cerebral cortex.

2. Local pain, burning and tenderness which are confined to the actual stump can be relieved by:

(*a*) Chemical or surgical interruption of the regional sympathetic outflow. These relatively minor and nonmutilating procedures are effective in an encouraging proportion of cases, especially when vasoconstriction and sweating are present to an abnormal degree.

(*b*) Section of the spinothalamic tract (chordotomy).

3. The peculiar pain and unpleasant postural sensations of the phantom limb will occasionally respond to sympathectomy or chordotomy, especially if the operation is performed at an early date, but these procedures invariably fail when the personality has started to deteriorate from prolonged suffering, introspection and morphine addiction.

4. In treating difficult problems of this sort it must always be borne in mind that any ineffectual and mutilating procedure, by adding another psychic trauma, must inevitably result in further suffering and loss of morale.

5. Experience has taught that a single resection of a neuroma is justifiable if it is definitely tender and the pain can be relieved by infiltration of procaine hydrochloride. Repeated excision of neuromas, neurectomy, reamputation at higher levels and resection of posterior spinal roots consistently fail and should never be used.

6. In the most severe forms of phantom limb pain, where in the past patients have sunk into hopeless invalidism, become morphine addicts or suicides, it may be possible to obtain relief by new types of surgical intervention directed at the highest centers in the brain. These comprise resection of the contralateral postcentral sensory convolution, from which the phantom sensations appear to be projected, or bilateral division of the frontal association fibers, which may be effective by freeing the patient of his intense introspection and anxiety. At present both must be regarded as purely experimental procedures, which will require extensive investigation before their therapeutic value can be estimated. The reason for presenting these procedures in their present theoretical stage is to call attention to their possibilities with the hope that they may aid in the solution of a hitherto insoluble problem.

THE AMPUTATION STUMP FROM THE PROSTHETIC POINT OF VIEW

MAJOR VERNON P. THOMPSON
MEDICAL CORPS, ARMY OF THE UNITED STATES

An amputation may be urgently necessary or elective. Once life has been saved, the usefulness of the stump becomes of paramount importance. These two functions of amputation are often quite inseparable, the good surgeon adapting the underlying principles according to the exigencies of the occasion.

SITES AND METHODS OF ELECTIVE AMPUTATIONS

There are desirable sites and methods of amputation which for a given partial loss of limb have a known usefulness and disability. A patient may reasonably require a stump of election to be a good one.

Selection of Site.—Sound elective amputations are those performed through a clean field at a site previously selected in the light of the traumatic, infectious and circulatory status of the limb which will permit fulfilment of all the basic requirements of a good stump. The age, sex and occupation and the social, economic and constitutional status of the patient, availability of a good limb maker and the surgeon's own experience are also important factors.

The Good Stump.—In the good stump there is freedom from pain, infection and circulatory disturbances. The soft tissues at the pressure areas are free from scarring. Nerve stumps are removed from pressure sites. There are no painful, projecting bone ends or spurs. The joints are freely and strongly movable by active muscles operating through an effective bony lever. In the lower extremity, end weight bearing and good knee joint function are of great value. Obviously, one cannot often have both.

Relation of Scar to Prosthetic and Anatomic Pressure Areas.—Since a stump's function is largely determined by the nutritional status of the pressure areas, the surgeon must know these areas for each type of stump and prosthesis. The best way to learn this is to examine various types of stumps of many years' usefulness. He will also observe that some features of a stump are more important than others. He will then be able better to evaluate various indications, sites, surgical technics, postoperative methods of care and prostheses.

As the palmar aspect of the hand and fingers is primarily adapted to grasping, so is the plantar aspect of the foot and toes adapted to full weight bearing. Note that the pressure pads extend over the tips of the digits. Finger, toe, hand and foot stumps should imitate nature. Form them from long palmar and plantar flaps and avoid a sensitive stump end.

The anterior aspect of the knee and the ischial area are partially adapted to weight bearing. Under favorable conditions they will become adapted to full weight bearing.

The skin over the patellar tendon, tibial tubercle, anterior tibial condyle and head of the fibula will adapt itself to considerable weight bearing in a properly fitted socket. The calf and thigh skin will take less pressure, but because of mechanical factors body weight is poorly transmitted through the lateral surfaces of the stump anyway.

Calf and lower thigh stump ends may occasionally bear some weight when the socket is fitted with an end pad. Therefore the scar should be posterior to the bone end. Even without end bearing, if the bone end is scantily covered transmission of the lateral pressure puts tension on the skin not well tolerated by scar adherent to the bone.

In the forearm and arm the stump end is not subject to pressure, since the prosthesis is actuated by lateral pressure. The scar should therefore be at the end of the stump.

Relation of Stump Shape to Prosthesis.—Major stumps of the extremities are somewhat conoidal throughout or terminate in a bulbous end. The Symes type stump at the heel and ankle and the end bearing knee stumps, the condylar, patelloplastic (Gritti-Stokes), capsuloplastic through the flare of the condyles will be bulbous, since they preserve a broad end bearing pad and are fitted with prostheses that are laced on, not fixed sockets entered from the end. Forearm, arm, lower leg and thigh stumps must be slightly conoidal in order to enter and withdraw from their fixed conoidal sockets. While these stumps must taper somewhat, they should not end in a projecting point of bone. Such a stump becomes painful and ulcerates on use. In the case of a midlower leg stump with a large muscular calf, the great bulk of the muscle bulges out in greater cross section than the tibial weight bearing area. The excess muscle should be cut off, since reasonable nicety in shaping the stump at operation will save much delay in conditioning and fitting it with a prosthesis.

The shape of the stump end is determined by the tissues utilized in covering it. The surgeon will bear in mind whether the stump is to be end weight bearing or not. If the first, then he must cover the end with skin and subcutaneous tissue capable of weight bearing. Avoid the useless practice of closing muscle flaps over the bone. It prolongs the period necessary to condition the stump to its final shape, size and consistency. Skin and the entire subcutaneous fascia will do very well. In certain stumps, muscular fascia or flat tendons are valuable in covering the bone end.

Efficiency of the Bony Lever as Regards Its Length and the Cross Section of Surrounding Soft Tissues.—The prosthetic efficiency of a bony lever is measured neither by its length nor by the size of the muscle cross section about it. If the bone is too long, as in amputation in the distal half of the lower leg, it is poorly clad with soft tissue. The slender, pointed stump end fits snugly in an unyielding socket; the skin is under constant pressure; its circulation suffers and stump troubles ensue. A shorter, suitably clad stump is better. Also the prosthesis can then be made to look like the other leg.

Conversely, with a midthigh or upper thigh stump, the usually large muscular cross section causes increased lurch from the telescoping of the limb within itself and the socket on weight bearing. While the bony lever is strongly actuated, its effectiveness is diminished by the play of the femoral stump within the soft tissues. In the thigh, every fraction of an inch above the lower thigh is precious.

This paper, in a symposium on "Amputations," is published under the auspices of the Section on Orthopedic Surgery.

While sites of election are still matters for discussion, it should be clear that there are a few basic physiologic and mechanical principles underlying the success or failure of each case. Intelligent application of these principles will increase the percentage of our successes.

SURGICAL TECHNIC

Most poor stumps are due to faulty surgery as to level, type and execution of procedure and postoperative care.

Tourniquet.—Too tightly applied tourniquets have caused serious vascular and nerve injury. If too loose, venous bleeding is increased. Familiarity with the location of the important vessels facilitates their isolation and clamping, so that a tourniquet is not strictly necessary. This should generally be the case in amputations for peripheral occlusive vascular disease. Otherwise the use of a tourniquet, preferably pneumatic, aids in a cleancut, accurate, gentle and reasonably rapid dissection.

Hemostasis.—The visible arteries and veins are ligated before release of the tourniquet. The larger arteries are carefully isolated with minimal soft tissue about them, doubly ligated at a gently clamped (not crushed) site with chromic 0 or equivalent, leaving a small distal tab. On large arteries, one of the ligatures should be of the transfixion type. On release of the tourniquet the bleeding points are grasped with fine forceps, avoiding unnecessary tissue, and ligated with plain 00 or equivalent. The wound should be as dry as possible before closure.

Incision.—Before making the incision, visualize or mark the proposed levels of soft tissue and bone severance so as to have the proper ratio. It is better to trim off excess soft tissue at closure than shorten the bone to an unfavorable length.

The knife is carried at a right angle through the skin and superficial fascia to its deepest layer immediately overlying the muscular, paratendinous, capsular fascia or the periosteum, as the case may be. The physical and circulatory integrity of the skin and superficial fascial flap must not be impaired. It is much more easily reflected anyway in the fascial plane between it and the deep fascia. Where the deepest layer of superficial fascia is fused to the deep fascia, include this with the superficial flap; for example, the fascia lata of the thigh, the muscular fascia of the quadriceps femoris, the deep fascia, capsule, tendon or even bone (patella) in front of the knee; the thin layer of deep fascia over the subcutaneous surface of the tibia, in turn continuous with the muscular fascia of the anterior compartment and closely overlying the periosteum, which must be left behind.

Pattern of the Superficial Flaps.—All styles of flaps are derived from the circular method which cuts and devitalizes the least tissue and is therefore the surgeon's general choice in amputations of necessity. When the several layers, including the bone, are so cut at successively higher levels and left open, best with a bit of traction, many times a good, useful stump will result without reoperation or only a minor one. An oval flap may well save useful length. Short, long, equal, unequal, anterior, posterior or lateral flaps and longitudinal extensions should be used only when necessary and not to demonstrate some anatomy that need never see the light of day. The purposes of flaps are to cover the bone end with either weight bearing or non-weight bearing soft tissue, to preserve the most useful stump length, to permit the necessary bone exposure with the least soft tissue trauma and to place the scar advantageously.

The Muscle Flap.—Closing muscle over the bone end merely delays stump conditioning while it degenerates and fibroses. Its bulk makes the end bulbous. Its slow shrinkage delays fitting the final prosthesis. Incise the muscular fascia distal to the bone level, incise muscle bellies circularly at the bone level, allowing the fibers to retract. The muscular fascia is closed over the bone. At sites where there is a broad muscular tendon, as the triceps of the arm and the calf group in the middle third, the muscle may be cleanly sliced off leaving a vascular tendinous flap sufficiently long to close over the bone, suturing it to the deep fascia anteriorly. In the distal forearm, the musculotendinous junctions are closed over the bone, in the proximal forearm only the muscular fascia.

The Periosteum.—The bone is exposed extraperiosteally for a short distance above the proposed saw line. A sharp knife is carried circularly through the periosteum ⅛ inch above this line. The periosteum is sharply scraped distally, leaving no shreds behind. The bone is sawn off at a right angle to its long axis or in the lower extremity to the weight bearing line ⅛ inch distal to the sharply cut, untraumatized periosteum. The marrow is not disturbed. For beveling the crest of the tibia, the periosteal incision is suitably shaped to allow beveling without further periosteal trauma. Sharp bone edges are smoothed with a sharp rasp. No proximal stripping is permitted, especial care being necessary at lines of muscular attachment, interosseous membranes and irregularly shaped bone, especially the fibula.

The Nerve Stump.—Nerves are identified during the formation of the flaps, clamped and cut. Before closure they are gently distracted and cut sharply across proximal to the level of the stump scar or level of pressure against the prosthesis. Larger nerves with vessels which would bleed are clamped and tied with small suture material.

Closure.—The flaps are tested for closure. Any excess is cut off. If there is too little soft tissue, more bone must be removed. Too much muscle is often the cause of undue tension of skin closure. The wound is closed in layers of muscular or deep fascia, and superficial fascia by interrupted mattress sutures of 0 catgut size or equivalent, as few as necessary being used and no more tissue being included than the suture strength calls for. The superficial fascia being approximated, moderately spaced fine silk skin sutures will readily coapt the skin. Drains are rarely necessary.

The Dressing.—A strip of xeroform gauze will add to the patient's comfort when the dressing is removed ten days later for removal of the stitches. A flat gauze layer is applied over the strip; then fluffed gauze is moderately snugged about the stump with a bandage, preferably elastic as bias cut muslin or stockinet.

Splinting.—Simple coaptation splints may be all that is necessary. Flexion deformities at the hip and knee are due to muscle spasm from the operative trauma, closure under tension increased by the swelling from roughly handled tissues. A light plaster splint is easy to apply and is efficient. Should there be unavoidable tension, traction through adhesive strips applied close to the wound is very helpful.

Postoperative Management.—Elevation of the part if the arterial supply is adequate will avoid much postoperative swelling. As the stump becomes comfortable and circulatory balance is obtained, periods of dependence increasing in duration and frequency are in order. Buerger-Allen passive vascular exercises may often be started before removal of the stitches. Barring fever, increased pain and drainage, the dressing is left undisturbed until this time. After the wound is healed, an elastic bandage is used to control circulatory stasis. Much of the "shrinkage" of the stump prior to wearing the prosthesis is merely recovery from the congested postoperative state. The better the surgery, the less the congestive and fibrotic condition to be recovered from. Graduated exposure of the stump to air, sun, soap and water, friction, exercise and dependence should condition the stump to permit fitting the prosthesis in weeks, not months.

Wearing the Prosthesis.—Early graduated weight bearing in a well fitting prosthesis is the final "making of the stump." It is not enough to start with a well fitted socket: it must be kept well fitting at all times. The stump pressure areas will not tolerate abuse or neglect. When localized discomfort and undue reactive rubor from spotty pressure appears, weight bearing must be discontinued and suitable adjustment made to the socket. Weight bearing only within tolerance limits is the rule. Particularly in the lower part of the leg, the inability of the tissue to stand the pressure exerted by the first socket on the weight bearing areas may soon become apparent again. Even if the skin does not break down, the daily period of weight bearing activity is diminished because of the feeling of weakness, insecurity, discomfort and pain. Early excessive pressure from poorly graduated use of a poorly fitted prosthesis produces permanent atrophic and fibrotic changes and diminishes the future usefulness of the stump. Poor skin hygiene is often followed by folliculitis and dermatitis.

Too often shrinkage is not promptly met by the use of interliners or new sockets. Frequently the second socket is made only after irreversible tissue changes have already taken place.

In various communities, limb makers are differently experienced in the fitting of the several types of stumps. The problem of the limb maker and his servicing of the prosthesis cannot be ignored. Some surgical and prosthetic customs are too fixed. Surgeons and prosthesists must learn from and cooperate with each other.

ELECTIVE SITES

Upper Extremity.—The function of the hand is determined by the ability to oppose the thumb and fingers and the security of its grasp. Any partial loss of the digits must leave a stump which will tolerate the friction and pressure of handling objects without discomfort. The patient should be able to tap hard on a table top with the end of the stump.

Distal Phalanx.—Very small tip defects will cover over well spontaneously, small ones with traction, and moderate defects require skin grafting. Larger defects usually require shortening of the bone to secure covering of the tip with pressure bearing palmar skin and subcutaneous tissue. Save the nail bed when possible. Save the distal interphalangeal joint but not at the expense of a sensitive stump.

Middle Phalanx.—Save all length possible. Since flexion is maintained by the sublimis, the deep flexor tendon need not be sutured.

Proximal Phalanx.—Its full bony length should be preserved. Suture the sublimis tendon to the dorsal aponeurosis, otherwise there will be no flexion control. A short stump is useless and should be removed if the other digits are intact. In the index finger, when strength of grasp is primary even a short stump usually adds to security. Ordinarily remove the short stump with the distal third to one half of the metacarpal by oblique osteotomy; dexterity and appearance are improved.

A stiff, straight finger is useless; remove it. But only one or two stiff fingers sufficiently flexed to permit opposition with a movable thumb are useful.

The opposing thumb is the most useful unit of the hand. Any part is useful even in complete loss of fingers, when artificial ones are used. An artificial thumb with movable fingers is less useful.

Principles.—Preserve all possible tissue initially. At definitive surgery, cover pressure areas with palmar tissue; leave a dorsal scar. Avoid closure under tension. Use a pressure dressing and elevation to avoid circulatory stasis. Don't use epinephrine in a finger block. Don't use a finger tourniquet.

The Forearm.—When no grasp whatever can be salvaged from a hand even with a prosthesis, maximum function will be obtained with a prosthesis fitted to the elective forearm stump. This is not higher than the middle and distal thirds or 2 to 4 inches above the distal ends of the radius and ulna. Some patients will insist on all possible length only to find the stump too long for a handy prosthesis and fit only for a paw. Use short, equal flaps for an end scar, since pressure in the prosthesis is lateral.

Above the middle and distal thirds, every fraction of an inch loses control and power until with a 2 inch stump the artificial hand is no longer operated effectively.

The Upper Arm.—Practically, an upper arm prosthesis is worn for esthetic purposes. Leaving the condyles as in an elbow disarticulation gives a clumsy stump and unnatural prosthesis. The elective site is 2 inches above the elbow joint line. With shoulder amputations, for the sake of appearance and simpler surgery, the humeral head is retained when the condition permits.

THE LOWER EXTREMITY

The loss of the toes causes little or no disability save for slight nondisabling loss of push off in vigorous walkers when the great toe is gone. A filler pad in the shoe adds to the patient's comfort. Place the scar dorsally and avoid disabling pain. Amputation through the base of the proximal phalanx is slightly easier and less traumatizing than disarticulation.

Metatarsals.—Preserve length only if the plantar flap will cover the bone ends and leave a dorsal scar. Carefully smooth the bone ends.

Metatarsal-Tarsal (Lisfranc) Amputation.—This fully end weight bearing elective site is very good when sufficient normal plantar flap is available to cover the end and give a dorsal scar. Preservation of the bases of the first and fifth metatarsals preserves better balance. A carefully fitted arch support and toe pad in the shoe

will improve function though the patient can walk without prosthesis or only a simple toe filler pad.

The Tarsal (Chopart) Amputation.— Amputation through the tarsus is not advised, since the muscle balance present in the Lisfranc is lacking. The next higher level is advised.

The Symes Amputation.—This amputation places the fully weight bearing pad of the heel over the distal ends of the tibia and fibula just above the level of the ankle joint. Since this stump is useless unless fully end bearing, the tissue of the heel pad must be normal before operation, be accurately placed on the lower leg at the operation, which must not impair the vitality of the flap, and be maintained in good position until firmly united. Reamputation at a higher level months or years later may usually be avoided by proper selection of cases, careful technic, reasonable use of the stump by the patient and fortunate absence of progressive vascular disease. The prosthesis is too clumsy to be satisfactory for most women but gives excellent weight bearing and a good push off on the ball of the artificial foot. The anterior scar should come just above the slight flare of the bones so as not to become irritated.

The incision consists of a transverse anterior portion and a vertical U passing under and in front of the heel from their common starting point at the malleolar level in the midaxial line of the leg as seen laterally. An anterior oval incision is somewhat simpler and easier to close. It is carried deeply through skin to ankle joint capsule, lateral ligaments, periosteum and plantar fascia. The ankle joint capsule is incised transversely, the astragalus freed from the mortice ligaments and displaced anteriorly, so as to permit dissection of the os calcis out of the posterior heel flap. This is carried out just extraperiosteally, great pains being taken not to traumatize the exposed soft tissue of the flap. Failure in these steps will jeopardize the vitality of the flap. Everywhere the deepest layer of the superficial fascia is left intact, in many areas the deep fascia as well and, of course, the achilles tendon. The muscles taking origin on the os calcis are left attached, though they may be dissected off the flap if originally included in it. The mortice is exposed by sharp extraperiosteal dissection and the malleoli sawed off one-fourth to one-half inch proximal to the tibial articular surface, the aperiosteal technic previously described being used.

After suitable ligation of the larger vessels the tourniquet is removed and as nearly perfect hemostasis as possible is obtained.

By this time the flap will have shrunk some, but the fitting of the long posterior flap to the anterior one takes judgment and patience. The bony stump must fit snugly in the center of the heel pad, which must not be permitted to slide sideways or forward. Ears may be judiciously trimmed but are usually better left alone. Small rubber drains in the corners and a snug pressure dressing maintaining the pad in place complete the operation.

At the first dressing, when the drains are removed, the position of the heel pad should be carefully checked.

The Lower Leg.—Tibial stump length of 6½ to 7 inches is ideal; even 4½ inches of bone length will give good function. But stumps with less than 2 inches length below the medial hamstrings are seldom effective. Near or at the hamstring level, full end bearing may be obtained by fitting with the knee flexed 90 degrees, using a laced socket.

The flaps should be broad, not pointed, the posterior one short, the anterior of medium length. The fibula is exposed by a posterolateral extension of the flap incision. Include the deepest layer of the superficial (fatty) layer in the incision. The treatment of the muscle, periosteum and so on has been previously described. The months so commonly necessary before fitting the prosthesis to lower leg stumps often have their basis in the trauma to the soft parts at operation. Expose the fibula in the muscle plane, sharply cutting the muscular and septal attachments; remove the periosteum from above the level of osteotomy. A Gigli saw obviates much retraction. Cut the fibula off 1 to 2 inches above the tibial site. Smooth the corners well. In short lower leg stumps it is often advisable to remove the entire fibula. When there is question as to the infectious status of the tissues do not do so, since the knee joint may be infected by continuity.

There have been many unsatisfactory lower leg stumps. Some experienced surgeons believe an end weight bearing lower thigh stump, particularly the Gritti-Stokes, is preferable in the long run to even a good lower leg stump. Generally the performance over many years of a good lower leg stump with a well serviced prosthesis will permit no needless sacrifice of the knee joint.

Amputations at the Knee and Distal Thigh.—Good condylar, Gritti-Stokes, capsuloplastic (Callander) and tendinoplastic (lower third) stumps permit considerable to complete end weight bearing.

All end bearing stumps at the knee and lower third must have a posterior scar. Owing to the retraction of the hamstrings and the nonretraction of the relatively fixed quadriceps muscle, even the circular open method will result in a posterior scar if sufficient soft tissue is present.

Even the time honored long anterior flap of the Gritti-Stokes amputation appears unnecessary after using a circular or oval incision with less dissection and vascular disturbance.

The method of condylar amputation as shown by Perry Rogers has given excellent end bearing stumps. In suitable cases it appears that the previously somewhat discredited condylar amputation at the knee merits serious consideration. The outside knee joint of the prosthesis presents an esthetic objection as with other excessively long thigh stumps.

Gritti-Stokes Method.—The essential feature of a good stump by this method is covering the bone end with an intact anterior flap of weight bearing skin, subcutaneous tissue, prepatellar fascia and the anterior portion of the patella, which should unite to the end of the femur. Usually a long anterior and a short posterior flap are formed. It is not necessary or desirable to dissect the skin and subcutaneous flap from the underlying patellotendinous flap. Saw off the posterior articular half of the patella before sectioning the femur. Section the femur at (not above) the level of the upper pole of the patella as noted with the anterior flap lying in its natural position. This is at the upper part of the flare of the femoral condyles. The patella will then naturally lie over the end of the femur. It should not drop posteriorly as when the femur is cut too short. Minimal dissection of the tissues from the femur will

minimize lateral mobility of the patella and help prevent lateral dislocation postoperatively. The patella may be sutured to the femur through drill holes or to the popliteal fascia and hamstring tendons. In any event, check the position of the patella every few days until fixation in good position occurs. Manually replace it if displaced, and maintain position by suitable bandaging. Rebandage as the effusion subsides.

Poor stumps and outright failures result from faulty selection of cases, interference with the circulation of the flap from excessive dissection and undercutting, faulty bone length and a loose wobbly pad of soft tissue and patella.

Tendinoplastic Method.—Excellent stumps, many of which are quite capable of end bearing, are obtained by bone section in the lower third with the soft tissue incision at the patellar level. The circular incision is ideal. Short square flaps take care of the ears if annoying to the surgeon but tend to lead to unnecessary dissection.

Middle Third of the Thigh.—As the more muscular portion of the thigh is approached, short anteroposterior flaps of gradually increasing length are very useful in reducing the trauma incident to the exposure and section of the femur. At a suitable more distal level the knife is carried through skin, fat and deep fascia, including the muscular fascia. With freeing at the septums the muscle bellies are exposed at a higher level, where they are sectioned circularly, each layer being allowed to retract before going deeper. As the deeper layers are cut they retract less and less. The exposed bone is sectioned by means of the aperiosteal technic. The great vessels are exposed in their fascial channels, doubly clamped and cut as the sectioning of the muscle proceeds. On closure, no muscle flap is turned over the bone stump. Owing to the absence of a large traumatized muscle mass, interrupted fine fascial and skin sutures are all that are necessary. The stump is well shaped. There is no muscle mass to shrink slowly. There is no blob of soft tissue at the end of the stump.

AMPUTATION STUMPS OF NECESSITY AND COMPROMISE

Doubtless many a surgeon has been surprised, after performing an amputation of necessity on leaving the stump open or compromising on selection of soft tissues and the location of the scar to preserve length, to find the stump serving very well from a prosthetic point of view without a secondary plastic operation, let alone a reamputation.

Simple procedures are often best. While life saving amputations should not primarily be concerned with securing a permanent stump, there is no need to sacrifice healthy tissue, useful length or leave a projecting bone end.

The circular or oval incision with muscle and bone cut at higher levels many times results in good functional stumps. The surgeon should be aware at the time of the emergency amputation that healing time, dressings, pain and disability are reduced by this method of open amputation.

The principle of traction in controlling retraction of tissues so well proved in the short sleeve of the stepped guillotine or circular amputation should likewise be applied to closed cases in which the soft tissue closure needs relief from tension. The splinting of traction utilizes the principle of rest in wound healing. Rest should be afforded closed stumps as well. A light plaster of paris bandage is excellent, being efficient, convenient and easy to apply.

It is urged that these simple principles be utilized more in the closed method as well.

RECAPITULATION

Poor stumps often result from surgical errors:

1. Wrong choice of level and type of procedure.

2. Excessive soft tissue dissection, periosteal stripping, trauma, strangulation ligatures and sutures.

3. Soft tissue closure under tension.

4. Redundant soft tissue.

5. Failure to use the open method when in doubt as to circulatory status and infection.

6. Failure to utilize traction or splinting.

7. Neglect of postoperative conditioning of stump, joints, muscle and skin.

Good stumps are made by good surgery:

1. Amputate through viable tissue, neither losing probably useful length nor risking the patient's life in attempting an elective closed amputation when a simple circular open amputation will conserve both.

2. Incise directly through each layer of tissue, the skin, fat and muscular fascia, the muscle, periosteum and the bone at successive levels, not slicing or undercutting or making extensive flaps. Freeing of connecting tissues of the several layers as at intermuscular septums is desirable. Cut the periosteum cleanly, leaving no shreds or flaps behind, and no spurs will form. Leave the bone end with a blood supply and avoid a ring sequestrum. Gentle retraction diminishes postoperative swelling. Careful hemostasis and minimal tissue within ties and sutures shortens postoperative healing and reduces circulatory disturbances. The stump will shrink less and hold up better.

3. Avoid tension; it prevents free circulation. This is a basic surgical principle. Long flaps are not necessary. Plan to have the correct ratio between soft tissue and bone length; don't leave it up to traction, handy stump saver that it is.

4. Trim excessive soft tissue off now; it will save doing it later.

5. Use the open method in cases of infection or potential infection. Healing is often rapid. Many stumps will be good without further surgery. If not, secondary closure, plastic operation or reamputation will make them so.

6. Use traction to maintain soft tissue length beyond the bone. Contracting granulation tissue will do the rest. When traction is unnecessary, a light plaster bandage rests the part—it heals better.

7. Use active motion as healing permits; it improves circulation, frees joint motion, builds muscle. Use an elastic bandage for congested stumps. Graduated friction and pressure accustom the stump to its next job—a prosthesis for weight bearing as soon as possible. The skin must be kept clean; soap, water, air and sun minimize minor cutaneous infections. Early graduated weight bearing on a well fitted prosthesis builds a healthy tough dermis. Don't abuse it.

Ashburn General Hospital, McKinney, Texas.

TEMPORARY PROSTHESES

LIEUTENANT COLONEL T. CAMPBELL THOMPSON
MEDICAL CORPS, ARMY OF THE UNITED STATES

The interval of time which elapses between the loss of an extremity and the application of a permanent prosthesis is a very difficult period of physical and mental adjustment. Anything that can be done to shorten this period and make the adjustment simpler, more rapid and more complete is well worth while.

All factors which tend to establish early painless weight bearing should be understood and applied. Operative and postoperative methods which provide a well healed painless stump as rapidly as possible are of primary importance. Early weight bearing is essential in toughening up a stump to make it fit for prolonged weight bearing. The accompanying illustrations will show some of the things that can be done to obtain a satisfactory stump, and various types of temporary

Fig. 1.—Applying stockinet and cardboard for building pylon.

prostheses will be demonstrated to show what can be done to provide amputees with walking appliances shortly after their stumps are healed.

Following the practice developed after the last war, it has been the policy at Walter Reed General Hospital to order an adjustable fiber leg (which compares quite favorably with the standard permanent legs on the market) as soon as the amputee is admitted, or when an amputation is performed. The leather bucket or socket for this leg is made as soon as the stump is well healed. As the leg shrinks, a new socket is made whenever the old one becomes too large. When these well made, easily changed fiber legs are not available, temporary plaster pylons are most valuable in toughening up the stumps and shortening the period during which the patient is entirely dependent on crutches.

The first question that a patient asks after losing a leg is "Doctor, when shall I get my new leg?" The mere act of measuring a patient for a leg, and his knowing that it is being made, cause him to look forward to brighter days instead of spending his time bemoaning his lot.

This paper, in a symposium on "Amputations," is published under the auspices of the Section on Orthopedic Surgery.

A recent convoy of patients who had been transferred from one hospital to another, during their evacuation, were primarily interested in getting furloughs to see their families. The amputation patients, however, were primarily interested in "When shall I get my leg?"

Figure 2.

Figure 3.

Fig. 2.—Stockinet pulled down over cardboard. Ready for application of plaster cast.

Fig. 3.—Plaster applied, forming socket for pylon.

Fig. 4.—Plaster socket incorporated into walking iron with crutch tip.

Measurements were taken and, while their legs were being made, short furloughs were granted, sometimes with the patient on crutches, but often on a temporary plaster pylon.

The following instances of war casualties illustrate three of the more important points:

1. Well healed satisfactory stumps should be obtained as soon as possible.

Fig. 5.—Patient walking to toughen up stump.

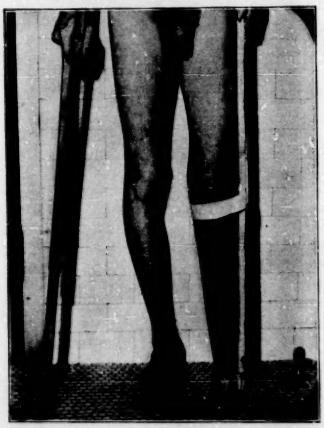

Fig. 6.—Crude temporary cardboard prosthesis.

Case 1.—An aviator who crashed in Greenland had both feet frozen so badly that they sloughed off. The patient could not be reached and evacuated until eighty-eight days after the accident. Immediate midleg amputations were done and legs fitted as soon as the stumps were healed.

2. Amputations should be of the guillotine, or open, type (especially in wartime), but traction applied at the time of amputation is absolutely essential in order to obtain a satisfactory stump. Cases 2 and 3 show what happens when this important postamputation treatment is omitted. Case 4 shows how readily a good stump can be obtained if constant traction is used.

Case 2.—A soldier aged 21 received a severe compound fracture of the right lower leg from artillery fire on Nov. 8, 1942. The circulation in the foot was inadequate, and a guillotine amputation was performed on November 11. No traction was used. On admission to Walter Reed General Hospital there was pronounced retraction of the skin. An effort was made on December 10 to save the knee by removing the fibula and freeing the skin; as satisfactory skin could not be obtained over the end of the stump by this procedure and because severe phantom limb pain persisted, a supracondylar amputation was done on Jan. 7, 1943. The phantom limb pain was eliminated and a satisfactory stump was obtained.

Fig. 7.—Lateral view of temporary pylon.

Case 3.—A soldier aged 23 received a high explosive wound in the left popliteal space on Nov. 10, 1942. Five minutes later a hand grenade was tossed into his shell hole, and the explosion produced a traumatic amputation of the right lower extremity just above the knee. A débridement was done the same day, but no traction was used until November 28, when he was admitted to Walter Reed General Hospital. Bone and soft tissue protruded 3 inches beyond the skin margins. After three weeks of constant traction the skin had come down even with the end of the bone. After six weeks of traction the bone was well covered. A plastic closure was done on Jan. 20, 1943, and a good stump obtained.

Case 4.—On Nov. 8, 1942 a soldier aged 26 received a gunshot wound of the left thigh which injured the popliteal artery. Gangrene of the foot and leg developed, and a low thigh guillotine amputation was performed on November 13. Constant skin traction was used. Three weeks after amputation the condition of the stump was excellent.

Traction was used together with a small wooden spreader to produce a transverse instead of a circular scar. Healing and contraction of the scar under seven weeks' constant traction was rapid. The patient was allowed up on crutches during

the day, but traction was constant. A complete closure of the stump was done on Jan. 14, 1943, just two months after the injury.

3. Temporary prostheses are most important in toughening up the stumps and preparing them for permanent legs.

Figure 6 shows an ingenious and extremely simple type of prosthesis that was used in the Danish Hospital in Paris during the last war. A heavy cardboard cornucopia is attached to a wooden stick. The patient uses this as a cane but bears some of his weight on his stump. It is laid aside when he sits down.

Fig. 8.—Permanent upper and lower extremity prostheses fitted. Patient ready for rehabilitation.

The various steps in making a plaster pylon for a below knee stump are shown in figures 1 to 5. (Incidentally, this stump was too long, and reamputation was done later.)

Plaster pylons for thigh stumps are made in a similar manner.

The adjustable fiber prostheses which are ordered at the time of amputation are shown in figure 10. They are strong, durable and inexpensive. The removable leather buckets can be made and the entire leg fitted and adjusted as necessary by any well trained brace maker, preferably one with some experience in artificial legs. These prostheses function practically as well as high priced willow or aluminum legs.

CASE 6.—A soldier aged 23 picked up two 37 caliber duds on April 11, 1941; an explosion blew off all the fingers of his right hand and produced a compound fracture of the left femur in the lower third. The right hand was amputated at the wrist.

Fig. 9.—Temporary pylon for short thigh stump.

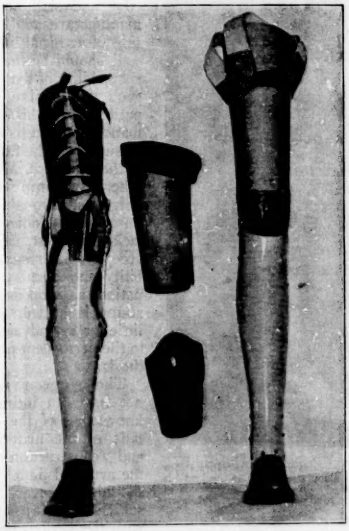

Fig. 10.—Adjustable fiber prostheses with molded leather sockets for leg and thigh stumps.

and the left femur was treated with Roger Anderson pin fixation. Because of intensive infection of the fracture site and the pin wounds, a high guillotine amputation was performed on August 29. A partially successful skin graft was performed

on October 27. The patient was admitted to Walter Reed General Hospital on June 26, 1942 for the treatment of a very short, painful left thigh stump with an adherent terminal scar and a right arm stump too long for a prosthesis. The right arm was reamputated and a plastic procedure performed on the left thigh stump. The temporary peg leg (on which the patient walked very well) and the final arm and leg prostheses are shown in figures 7, 8 and 10.

THE PERMANENT PROSTHESIS

ATHA THOMAS, M.D.
DENVER

Modern skill has brought no more useful aid to humanity than the artificial limb, or prosthesis, which transforms a helpless dependent into a useful member of society. The modern limb maker is a highly skilled artisan who is eager to aid the surgeon in the rehabilitation of his patient. He belongs to an old and honorable guild with a record of fine service and with a high code of ethics, designed to prevent exploitation of the handicapped by the unscrupulous. Such a code of ethics is subscribed to by the Association of Limb Manufacturers of America. This organization is doing a splendid work through its educational and research program in advancing knowledge and skill in the manufacture and fitting of artificial limbs.

Fig. 1.—Conventional prosthesis for midcalf amputations. The weight is borne largely on the sloping surfaces of the tibial condyles, anteriorly and laterally.

It should be the responsibility of the surgeon to advise the patient as to his permanent prosthesis and to supervise the fitting of the appliance. Many otherwise competent surgeons, through ignorance, prejudice or lack of interest, fail to accept this responsibility and dismiss the patient as soon as the stump is healed, with little or no advice as to the permanent prosthesis.

The surgeon need not have an intimate knowledge of the details of the materials and construction of the artificial limb. He should, however, be sufficiently familiar with the various types of limbs available and should have some knowledge of the standard types of joint control mechanisms. He should know enough about the fitting of appliances to recognize it as a skilled art and advise his patient as to the advantage of a personal fitting at the place of manufacture.

The emotional disturbances accompanying the loss of a limb are often serious, and the necessary adjustment to the loss is difficult for some patients. This problem of emotional adjustment is made much easier for the patient if he realizes that the surgeon continues interest in the case even after the stump is healed and is willing to assume some responsibility in advising him concerning the permanent prosthesis and in supervising its fitting.

Fig. 2.—Conventional prosthesis for midthigh amputations. Weight bearing is carried almost entirely from the ischium. Note the "muscle strap" of leather and elastic which controls knee motion.

Personal acquaintance with the limb maker on the part of the surgeon and willingness to work in close cooperation with him inspire confidence on the patient's part and aid him in an otherwise difficult adjustment. The shorter the period between amputation and prosthesis, the easier the adjustment is likely to be. Unnecessary delay results not only in faulty psychologic adjustments and habits but in joint contractures and atrophy of the stump.

The skill and care with which an amputation is performed and unremitting attention to the postoperative care are tremendously important factors in hastening the time when the permanent prosthesis can be applied. The advantages of the temporary prosthesis in hastening the shrinkage and toughening of the stump have already been discussed by Major Thompson.

This paper, in a symposium on "Amputations," is published under the auspices of the Section on Orthopedic Surgery.
The executive officers of the Association of Limb Manufacturers of America gave generous help in furnishing data and models.

THE STUMP

The most important requirement for a comfortably fitting, efficient limb is a properly formed stump. Improperly placed operative scars, deficient or excess bone length, redundant muscle, tight skin flaps and exposed nerve ends all tend to make fitting difficult and weight bearing and locomotion fatiguing and painful.

CONSTRUCTION OF PROSTHESIS

The standard construction of an artificial leg usually consists of the (1) socket, (2) knee piece, (3) shin piece and (4) foot.

The socket is that portion of the limb into which the stump is fitted. It is usually constructed of willow or basswood, carefully cut out to fit the contours of the stump. The wood socket is covered with tightly stretched rawhide, which greatly adds to its strength. Leather and fiber are also used for the socket. Some metal and some plastic sockets have been made but are not in general use. Aluminum alloy makes a light and durable limb but is more expensive and is not readily available now.

The knee piece is an important control mechanism allowing knee motion with stability. The proper fitting and alinement of the knee joint axis is of the utmost importance. Side joints at the knee are used in amputations below the knee. Should these joints be placed too far anteriorly, pressure will result in the popliteal space, causing edema of the stump. Stability and control of the artificial knee joint and the prevention of buckling, or "jackknifing," in thigh amputations are provided by various ingenious devices. It is not necessary to give a detailed description of all these mechanisms. Knee motion is usually controlled by a "muscle" strap of leather, with elastics on either end, which is attached to the pelvic belt and passes over a roller fastened to the shin piece inside the knee. As the knee is flexed, pressure is applied to the control strap pulling the shin piece forward for the next step. Knee joint control is also effected by the proper setting of the joint axis. The farther posterior the axis is set the more positive is the knee lock when weight is applied.

Fig. 3.—Prosthesis for end bearing stump at the knee of the Gritti-Stokes or Rogers type.

The foot in most general use today is made of wood with a joint in the forefoot of rubber belting and with limited motion at the ankle. Rubber pads or bumpers are placed in heel, instep and forefoot. The position and thickness of these rubber pads in the foot also affect the stability of the knee joint. Increasing the "fixed equinus" of the ankle by raising the front pad in the instep tends to throw the knee into hyperextension and increases knee joint stability.

COMMON TYPES OF PROSTHESIS FOR AMPUTATIONS AT VARIOUS LEVELS

End bearing stumps are successful only in the region of the ankle and knee. These amputations are very popular in Canada and, according to Gallie, are much preferred there to midcalf and midthigh amputations. They are not so popular in this country or Great Britain. Limb makers object to them because of difficulties in making a prosthesis that is comfortable and that conforms to the shape and length of the opposite limb. Another difficulty encountered with a prosthesis for the Syme amputation is preserving sufficient strength at the ankle to take care of the excessive strain when weight is borne on the ball of the foot.

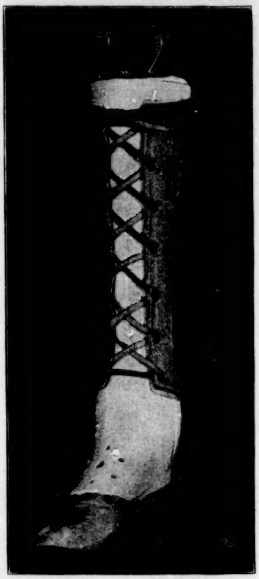

Fig. 4.—End bearing prosthesis for the Syme amputation through the ankle.

In midcalf amputations the weight is borne largely on the sloping surfaces of the tibial condyles, avoiding pressure in the popliteal space. The stump should be fitted into socket with the knee slightly flexed, causing more weight to be carried forward over the anterior portion of the tibia.

With amputations through the knee joint of the Gritti-Stokes or Rogers type, weight is carried on the end of the stump and on the sloping surfaces of the thigh. The socket for such a stump is usually made of heavy leather with a front opening for lacing and with a felt pad on the end for weight bearing.

Weight bearing in thigh amputations is carried almost entirely from the ischium. Some weight may be taken on the sloping surfaces of the thigh, but all pressure on or near the end of the stump must be avoided. Undue pressure must also be avoided in the adductor region. Pressure boils in this area are common as the result of an ill fitting ischial seat. In this type of limb, suspension by a pelvic band with a joint at the hip and with direct stump control seems to be most generally favored, although some patients find shoulder straps preferable. The majority of limb makers recommend a rigid type of hip joint control with no lateral motion.

Artificial limbs for hip joint disarticulation offer a difficult problem. If sufficient muscle about the hip is preserved so as to give a good seat, a conventional type of above knee limb with a saucer shaped socket can be successfully fitted. If the amputation does not permit this type of prosthesis, then a bucket type socket or a "tilting table" prosthesis must be used. A hip lock is always necessary with this type of appliance and in most cases a knee lock as well.

Fitting of Prosthesis and Care of Stump.—Careful fitting and alinement of the limb and instruction of the patient in its proper use are of utmost importance. The stump is protected by a woven stump sock of virgin wool. One, two or more of these socks are worn, depending on the amount of shrinkage that takes place in the stump. The socks should be changed daily and kept scrupulously clean to avoid skin irritation or infection.

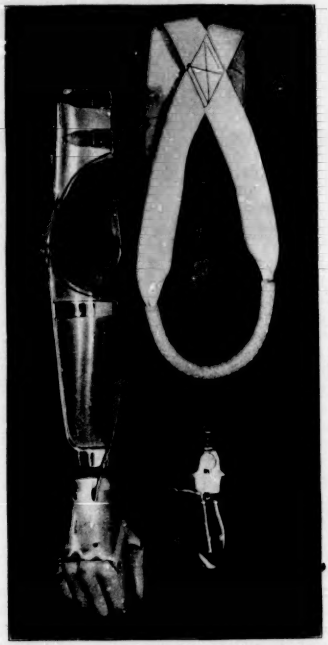

Fig. 5.—Conventional type of upper extremity prosthesis equipped with a mechanical hand, interchangeable with a utility hook, and controlled by straps from the opposite shoulder.

Upper Extremity Prosthesis.—The use of prostheses in amputations of the upper extremity is not nearly so satisfactory as is the lower. The successful wearing of such a prosthesis depends not only on the character of the stump but on the psychologic adjustment of the patient in learning to use it. The most successful prosthesis is that fitted to a short forearm stump and equipped with a mechanical hand, interchangeable with a utility hook and controlled by movements of the opposite shoulder.

CONCLUSIONS

It should be emphasized that in the successful fitting and use of prostheses not too much importance should be placed on the particular type of limb, materials used or certain special features, such as complex joint controls. The more important considerations from the point of view of both patient and surgeon are whether the socket properly fits the stump and whether the limb is well constructed and of proper alinement and length.

Success in the rehabilitation of a person crippled by the loss of a limb depends first on a well performed amputation with a stump of proper contour and length, and finally on the closest cooperation between the surgeon and a skilled, ethical limb maker in the selection and fitting of the permanent prosthesis.

1612 Tremont Place.

ABSTRACT OF DISCUSSION

ON PAPERS OF MAJOR GENERAL KIRK AND LIEUTENANT COLONEL MC KEEVER, COMMANDER WHITE, MAJOR V. P. THOMPSON, LIEUTENANT COLONEL T. C. THOMPSON, AND DR. THOMAS

LIEUTENANT COMMANDER HARRY B. MACEY[1] (MC), U.S. N.R.: There will be an immediate need for a great number of amputations in a late teen and early adult age of men—a group in which close relationship between the surgeon and the patient may play a most important part. In the military service the medical officer is looked on with respect and, at times, admiration, thus creating an ideal condition for encouraging early rehabilitation of the crippled serviceman from both a mental and a physical standpoint. The guillotine amputation with the operative procedure and postoperative care, the details of which are a result of much experience, need only to be followed to obtain good results. The clinical observations referred to in 150 amputations, including those on patients from all theaters of operations of the present war and performed under various conditions and by surgeons of varying experience and ability, are self explanatory and should be sufficient proof of the value of, and at times the necessity of, the guillotine operation. The article referring to the amputation stump from the prosthetic point of view should be carefully read by every surgeon and medical officer who anticipates that he might be called on to perform an amputation. In the elective midcalf or below-knee amputation, fixation of the fibula to the tibia, accomplished by roughening the lateral and medial aspects of the bone ends of the tibia and fibula respectively and transfixing the fibula to the tibia by use of a vitallium screw, will prevent the chance of a floating fibula, which at times detracts from the usefulness of the stump by its mobility. The use of the temporary prosthesis has not been sufficiently stressed in the past, but its advantages are manifold and should be routinely employed, especially in young amputees. An additional temporary prosthesis not offered in the symposium, but which may be used advantageously, is the use of a well padded plaster of paris socket attached to a crutch at the level of the amputation. This encourages early physical activity and mobilization in weight bearing of the recently amputated extremity. The opening statement in the discussion on pain after amputation and its treatment should serve as a warning to those attempting to relieve phantom pain unless they have a deeper insight into the subject than is generally understood. The list of nonbeneficial procedures suggested should be carefully reviewed so that useless procedures will be avoided. The only procedure which should be employed, save in the hands of one experienced in this field of surgery, is the single resection of a neuroma when it is shown to be indicated.

DR. PHILIP D. WILSON, New York: The number of amputations performed each year among the civil population of our country far exceeds that in the Army during the last war or

1. This discussion has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth are those of the writer and are not to be considered as reflecting the policies of the Navy Department.

the number that may be anticipated among our armed forces during the present war. The artificial limb manufacturers of the United States report that in 1942 they supplied limbs to approximately 70,000 civilians, whereas the total number of amputations in our army during World War I was about 4,000. There is, therefore, as much need for improvement of knowledge among surgeons and limb makers in time of peace as in time of war. War conditions, however, impose a different outlook on surgeons from those of peace with regard to how amputations shall be done. While the requisites of a good amputation stump remain the same, different methods must be employed to obtain them. In the combat zone, where surgery must often be done under primitive conditions and the patients must be evacuated rapidly over considerable distances to hospitals in the rear, it is obviously unsafe to suture wounds of any type, including amputation stumps. The same applies to amputations that are performed in the presence of infection, wherever they may be done. General Kirk and Colonel McKeever present sound arguments for the use of the guillotine method and they rightly emphasize the importance of skin traction in the after-treatment. The senior author treated many hundreds of amputations in the last war and no one is better qualified than he to give an opinion of the good results that may be achieved by these methods when properly used. I am in complete agreement with the conclusions of these authors and I would like to emphasize particularly the necessity of applying skin traction to the stump continuously from the time of amputation until healing is achieved. The most serious cause of interruptions of such treatment in the present war is the evacuation of patients from one hospital to another over long lines of communications, finally terminating in a voyage over seas. These difficulties should be overcome by the use of the Thomas splint to provide fixed points of traction and counter traction or if the patient is ambulatory by the application to the stump of a plaster bucket in which is incorporated a heavy wire frame to provide a point of fixation for the traction. Now that skin grafting is being employed so successfully for the early closure of granulating wounds, a word of caution is necessary about the use of this method to close amputation stumps. A skin graft will never tolerate the stresses caused by the use of an artificial limb, and excision of the graft with plastic closure of the skin will be required. But the application of the graft interferes with the normal process of scar contraction, which is relied on together with skin traction to pull the normal skin down over the end of the stump. Closure by skin grafting is therefore likely to result in greater difficulty for the surgeon when he attempts later plastic closure than when natural healing is allowed to take place. Continuous skin traction is a better method for obtaining healing than skin grafting and will require only a slightly longer period of time. There is no point of disagreement with Major Thompson. I would emphasize the need for judgment in choosing the level of amputation and particularly would point out the advantages of the Syme, Gritti-Stokes or tendinoplastic amputations when possible. These stumps are capable of direct end bearing and will stand heavier service with greater comfort to the patient than many other types of amputation of the lower extremity. Commander White considers the painful neuroma of little importance in causing intractable pain and gives chief attention to the surgical methods that attack the central nervous system at higher levels in order to obtain relief. Certainly all surgeons who have had experience in the treatment of painful stumps will agree that there are many cases in which pain persists even after the removal of all possible local or peripheral causes and where they have been at a loss how to give relief. In presenting the other surgical methods that may be used and the results that have been obtained, Commander White has made a real contribution. The discussion of temporary and permanent prostheses by Lieutenant Colonel Thompson and Dr. Thomas emphasizes the objective of all surgery, which is to produce a stump capable of optimum function with an artificial limb. Only the surgeon who is familiar with the construction and mechanical principles of these limbs is capable of doing this, but unfortunately many surgeons are called on to perform amputations in an emergency who do not have this knowledge. It is their duty to familiarize themselves on these points in order that their surgery may not only save their patients' lives but give them utmost comfort in the years that follow. Finally I should like to express the opinion that the system of temporary prosthesis now being used by the Army, which was reported by Lieutenant Colonel Thompson, represents the best that can be done for our soldiers with amputations and is far superior to the peg legs fitted with plaster of paris sockets which were used so extensively during the first world war.

DR. J. ALBERT KEY, St. Louis: The guillotine amputation has stood the test of time as a saver of life and length of limb in military surgery. This is not a severance of the limb, such as would be made by a guillotine, but is one which leaves the fresh stump with a square end. When traction is applied to the skin this square end becomes a shallow funnel with the end of the bone at the bottom. This traction should be applied at the time of the operation and continued even during transportation if possible until the scar is well contracted and fixed to the end of the bone. This is especially important in short stumps. The amputation should be performed at the lowest level permitted by the viability of the tissues, and this applies to the hand and foot as well as to the cylindric portions of the extremity. The surgeon who performs the primary amputation saves the life of the patient, prevents spreading infection and saves as much of the extremity as possible. The surgeon who performs the secondary operation selects the level of the amputation and so fashions the stump that he gives the patient the best possible result. The final amputation or plastic closure of the stump is an operation which requires a high degree of surgical judgment and skill. Our Army has recognized this fact and has met the problem by establishing five amputation centers, in each of which the amputation service is headed by a surgeon who has developed the required judgment and skill. The patients are transferred to one of these centers for the final operation and the fitting of the prosthesis. At a recent conference on amputations by representatives from Great Britain, Canada and the United States the experiences of the armed forces were pooled for the benefit of all. The Canadians are partial to end bearing stumps (Stokes-Gritti and Symes). The English dislike long stumps on account of circulatory disturbances and use ischial bearing prostheses for most of their below knee amputations. I prefer a slightly longer stump and take most of the weight on the sides of the below knee stumps. Muscle and tendon plastic stumps are largely abandoned, and the end of the bone is covered only by skin and fascia. Excess muscle is excised and permitted to retract in order to give a conical stump. But in plastic closures on guillotine stumps the muscle should not be freed from the bone because this stabilizes the tissues and, as Col. T. C. Thompson has noted, often gives a better stump than is obtained by an elective amputation. Excessive tension on the skin flaps is to be avoided but, if unavoidable, can be neutralized by skin traction, which is continued until the wound is healed. The temporary prosthesis supplied by our Army is really an excellent artificial leg fitted by experts, and our patients are fitted and taught to use their limbs with as little loss of time as possible. Dr. Atha Thomas has emphasized the cooperation which should exist between the surgeon and the limb maker and has noted that the surgeon's responsibility is not ended until the patient is fitted with a satisfactory limb. Attention should be called to the facts that not only is the Association of Limb Manufacturers of America conducting a research program but its members have unselfishly pooled their patents in order that the best possible prostheses may be available. I can say little about postamputation pain except that it is now believed that the important nerves should be drawn down slightly and cut cleanly across and permitted to retract. Ligation, injection with alcohol or crushing of the nerve before cutting is discouraged. If phantom pains appear, it is possible that early injections of the peripheral nerves or of the sympathetic ganglions with procaine hydrochloride as recommended by de Takats and Miller (*Arch. Surg.* **46**:469 [April] 1943) may prevent much later pain and disability.

CHRONIC MALARIAL PARASITEMIA IN ITALIAN PRISONERS OF WAR

CAPTAIN STANIS P. CARNEY
SANITARY CORPS, ARMY OF THE UNITED STATES
AND
CAPTAIN NOAH B. LEVIN
MEDICAL CORPS, ARMY OF THE UNITED STATES

The internment of prisoners of war has presented an opportunity to study under closely controlled conditions the incidence of parasitemia in a large group of men who have been returned from an area where malaria is hyperendemic to a malaria-free region.

The present study was initiated in a prison camp with a population of close to 3,000 Italian prisoners of war. About two thirds of these men came directly from the North African area. The remainder came from the same theater, but they had spent three months in another camp before being transferred here. All of them had seen service for varying periods in malarious regions, some as long as ten years, although the average was about two years.

It soon became apparent that malaria was going to be a problem of some concern in this camp, since immediately after arrival of the prisoners cases of malaria began to appear. The first question which arose was the problem of transmission of the disease to the uninfected prisoners, to the army personnel attached to the camp and to the nearby civilian population. This was satisfactorily answered by the results of two mosquito surveys made in the area in which the camp is located, one made by the state university and the other under the direction of the Seventh Service Command, in both of which no anopheline mosquitoes were found. As an added precaution, however, all men hospitalized for malaria were screened by mosquito bars after dusk.

The proposal to send some of the prisoners to work on farms in the region of the camp raised another question. Since, in many cases, side camps were to be set up, sometimes many miles away from army hospital facilities, it was decided to make an attempt to locate all men with parasitemia.

METHODS

Both thick and thin blood smears were made for each man, prepared wtih Giemsa stain. Thick smears were examined to determine the presence of malaria parasites, and when the number of parasites found was sufficient to make a search of the thin smears practicable these were studied to prove further identification of species. At least two smears, taken two or more days apart, were examined for each man. In addition, at the time the smears were taken every man was asked if he had ever had malaria.

RESULTS

The accompanying tables give a statistical analysis of the results. The breakdown by companies (table 1) has a certain value, in that part of the fourth company, together with the men in companies 5 through 8, came from the other camp, where a number of active cases occurred not included in these results. These men constitute one of three groups into which the camp might be divided, the others being the first four and the last four companies. The men in each group had fought together and were taken prisoner at about the same time and in the same region. This may account for the fairly high percentage of positive smears in the first four companies as contrasted with the others.

The organisms of all the positive smears were identified as Plasmodium vivax except two each of Plasmodium malariae and Plasmodium falciparum. This agrees with the usually accepted fact that P. vivax is the type most likely to recur. Fifty-six cases of active clinical malaria have occurred to date, all proved by microscopic study. A number of recurrences has brought the total number of admissions for malaria to a somewhat higher figure. Thirty-two additional patients transferred from a general hospital overseas with a diagnosis of malaria are not included in the tabulated results since there was no evidence in their records of blood studies and no parasites were found in the blood here.

The onset of cooler fall weather was followed by a striking and abrupt cessation of admissions of men with active malaria to the hospital. The blood smears from the seventh company were taken after this time, and while only a small group is represented, it is felt that this is reflected in the low percentage of positive smears for those men.

TABLE 1.—*Statistical Breakdown by Companies*

Company	No. of Men	No. of Positive Smears	Percentage of Positive Smears	No. of Active Cases	Percentage of Active Cases
1	250	49	19.6	13	5.2
2	250	34	13.6	5	2
3	250	39	15.6	7	2.8
4	250	20	8	6	2.4
5	250	15	6	4	1.6
6	250	20	8	1	0.4
7	250	9	3.6	3	1.2
8	156	8	5.8	6	3.8
9	250	17	6.8	0	0
10	250	20	8	4	1.6
11	250	21	8.4	4	1.6
12	67	6	9	3	4.5

TABLE 2.—*Summary Data*

	Number	Percentage
Total number of men	2,723	
Men with positive smear	257	9.7
Men with active malaria	56	2.1
Men with history of malaria	188	6.5
Men with active malaria and no history	33	59
Men with positive smears and no history	212	83

A glance at table 2 will immediately make it apparent that a history of previous malaria was unreliable in this group. It will be noted that 59 per cent of the men with malaria gave no history of ever having had the disease before. A considerably higher figure, 83 per cent, of all patients with positive smears failed to give a history of previous attacks. In spite of the fact that most of these men seemed to know what malaria is like, it is probable that a greater number had had malaria in the past than would be indicated here. Repeated questioning of the hospitalized men sometimes drew out a history previously denied. Yet even after such persistent questioning, over half of the men with active malaria had no knowledge of past infection. While it is probably true that the same repeated questioning applied to all the men would have raised the number who admitted having had the disease, there would still be a large group who would persist in their denial of previous attacks. We do not suggest that the same situation will prevail with American troops. The language difficulty inherent in dealing with prisoners of war makes any such comparison of expected results

This work was done under the direction of the Seventh Service Command.
Lieut. Col. George F. Swanson, M. C., station surgeon at the camp investigated, gave all possible encouragement and assistance.

impossible. American soldiers, furthermore, are thoroughly schooled in the symptoms of malaria, and it is to be expected that they will have more insight for otherwise unexplained symptoms.

Included in the foregoing group are the men who were infected but who had no clinical symptoms until months later. According to their own statements, antimalarial drugs are not used routinely in the Italian army for prophylaxis in endemic areas. Each man, however, is given a package of drugs to take at the first suggestive symptoms. It would appear, then, that drugs taken under these conditions may increase the incubation period to a much longer time than is usually considered customary and that clinical symptoms will not necessarily appear shortly after the intake of prophylactic medication stops.

It is admitted that this type of study will not find all the cases. At least 1 patient was admitted to the hospital with proved malaria only a week after his blood had been examined and found free of plasmodia. Five men with positive smears were selected at random for more complete study. Two of these eventually came down with clinical malaria; the other 3 never exhibited active symptoms. Smears were examined for these 5 twice a week, and at times parasites could not be demonstrated after the most critical search. In spite of the fact too that no man with active malaria was discharged from the hospital until two consecutive thick smears were negative, there were some recurrences.

CONCLUSIONS

1. Plasmodia may still be demonstrated in the blood months after evacuation from an area where malaria is endemic. In the group investigated this was found true for a fairly large number, aggregating almost 10 per cent.

2. It is possible to find parasites in the blood of a person even though he maintains that he has never had malaria. Where language difficulty is a factor, as with prisoners of war, this may operate to make the presence or absence of a previous history unreliable in selecting men who may have a residual parasitemia.

3. Malaria may be contracted with no symptoms of active disease until months after infection. This is probably particularly true when antimalarial drugs are taken prophylactically, and the symptoms will not necessarily appear when intake of the drugs ceases.

4. No expectation of the residual malarial rate of United States troops can be predicated from these figures. A great many of the Italians grew up in malarious regions and were exposed and infected long before their period of military service, while only a relatively small percentage of American soldiers come from areas where malaria is present in any degree at all. The antimalaria precautions taken for United States troops in the field also serves to keep the incidence of malaria down. An advice from the office of the Surgeon General of the United States Army indicates that the incidence of parasitemia in the absence of clinical symptoms for our returned troops is much lower than the figures reported here for the prisoner group. In spite of these differential factors, we feel that this study emphasizes the necessity for careful examination of blood smears for all personnel who have returned from areas where malaria is prevalent and the need for treatment to sterilize the blood in all cases of parasitemia. This will serve the double purpose of protecting the person from further attacks and of eliminating him as a carrier.

Clinical Notes, Suggestions and New Instruments

ACTINOMYCOSIS OF THE SUBCUTANEOUS TISSUE OF THE FOREARM SECONDARY TO A HUMAN BITE

LIEUTENANT ROBERT A. ROBINSON, MEDICAL CORPS,
ARMY OF THE UNITED STATES

In 1930 Henrici stated that "any suppurative inflammatory reaction which stubbornly resists treatment but tends to discharge continuously should lead one to suspect the possibility of actinomycosis." [1]

In the medical literature there are only a few case reports of actinomycosis secondary to human bites.[2] Perhaps this scarcity of case reports makes one less prone to suspect actinomycosis when dealing with a chronic infection secondary to a human bite than to think of tuberculosis, osteomyelitis or a foreign body reaction.

This case is reported to emphasize the importance of considering actinomycosis as a possible sequela of a human bite.

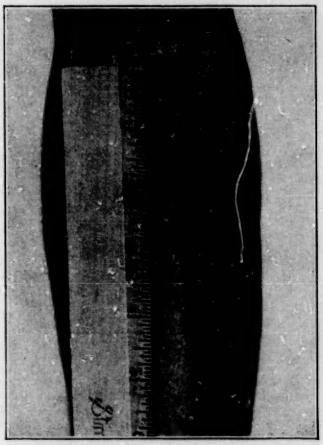

Fig. 1.—Surgical scar with pigmentation.

REPORT OF CASE

R. L. M., a man aged 21, admitted to the hospital March 26, 1943, was not acutely ill but complained of pain and swelling just below the elbow on the left forearm at the site of the human bite which he had sustained two and a half years before. His previous history was one of generally good health except for acute mastoiditis with mastoidectomy at 7 years of age, pneumonia at 8 and scarlet fever at 20. These illnesses had left no obvious disease of any system. Notable injuries were limited to the one which initiated the present illness.

Sept. 7, 1940, while playing volley ball, the patient sustained the human bite wound. He struck his elbow against another man's front teeth. Iodine was immediately poured over the two small tooth wounds, and the arm was bandaged.

Two days later a cellulitis developed in the left arm. A physician made a short incision connecting the two puncture wounds and sent the patient to bed. He received about 4 Gm. of sulfanilamide a day for ten days. The arm was elevated, and wet soaks were applied. The cellulitis subsided and the skin wound healed, but the area remained slightly red, indurated and tender.

1. Henrici, A. T.: Yeasts, Molds and Actinomycetes, New York, John Wiley & Sons, Inc., 1930.
2. Cope.* McWilliams.*

One year after the original wound, during the second recurrence of a localized abscess in this area, a study of pus from the abscess failed to show tubercle bacilli, and x-ray changes of osteomyelitis or of a foreign body in the tissues were not found. No apparent attempt was made to investigate the possibility of actinomycosis.

Acute abscesses recurred at the site of the bite wound whenever it was bruised. These abscesses drained some watery pus and healed spontaneously. There was persistent induration and tenderness of the soft tissues in this area for two and a half years.

On March 23, 1943 the patient bruised the site of the chronic inflammation, and three days later he came to the hospital for surgical relief, no spontaneous drainage having begun.

The patient was 70 inches (178 cm.) tall, weighed 140 pounds (63.5 Kg.) and was of the asthenic habitus. The blood pressure was 115 systolic, 76 diastolic, the pulse rate 80 and the respiratory rate 20. The temperature was 97.8 F. The red blood cells numbered 5,200,000, the white blood cells 12,500, with 77 per cent polymorphonuclears, 15 per cent lymphocytes and 8 per cent monocytes. The Kahn test was negative, and the urine normal. The physical examination was negative except for the left upper extremity. There was a tender, hot, fluctuant, soft

Fig. 2.—Actinomyces, × 100 (U. S. Army Medical Museum negative number 76449).

tissue swelling measuring 3 by 2 inches overlying the proximal fourth of the left ulna. A ¾ inch scar at the site of the original wound lay transversely across the top of the fluctuant area. The surrounding skin was red, but the skin on the top of the abscess was pigmented, light brown and violaceous. X-ray examinations of this area were negative for osteomyelitis, periostitis, a foreign body and soft tissue calcification.

The abscess was opened with the patient under general anesthesia in the operating room, sterile technic being observed. Through a 2½ inch incision in the long axis of the arm about 5 cc. of odorless grayish pus of milky consistency was evacuated, smeared and cultured. Digital examination of the abscess cavity revealed necrotic granulation tissue in which small yellow bodies about 1 mm. in diameter were noted. This tissue was fixed in alcohol. The periosteum and bone underlying the abscess were normal.

A dressing of sulfanilamide crystals and zinc peroxide paste, without packing, was applied to the wound postoperatively and almost every day for three weeks. The wound completely healed in four weeks and no induration, tenderness or heat was discernible in the area four months after the surgical drainage of the abscess. The infection had subsided for the first time in two and a half years. The only residuum was the pigmentation on each side of the surgical scar (fig. 1).

PATHOLOGIC FINDINGS

Microscopic examination of the pus showed no cocci or bacilli but many polymorphonuclear leukocytes and monocytes. The aerobic and anaerobic cultures of the pus were sterile after twenty-four hours and in ten days. It was concluded that the pus offered no clue as to the etiologic agent.

Macroscopic examination of the granulation tissue revealed small yellow specks, which were crushed, smeared and gram stained. This preparation of the sulfur granules demonstrated numerous gram positive, threadlike mycelia with axial filaments, true branching and clubbing about the mycelial tips. These slides were sent to the late Dr. A. T. Henrici, professor of bacteriology at the University of Minnesota Medical School, who reported: "I have examined the smear from R. L. M. and I believe there is no doubt that this is a case of actinomycosis. The smear shows the typical branched filaments of actinomycosis bovis."

The granulation tissue was sent to Letterman General Hospital, San Francisco, where it was sectioned and examined by Major Harold L. Stewart, M. C., pathologist, who reported: "The specimen of granulation tissue is composed of loose fibrous tissue, numerous dilated proliferating capillaries and many inflammatory cells. In one area there is a large, irregular felted mass composed of a granular and threadlike, basophilic inner portion and a well demarcated peripheral border. This peripheral border shows an inner basophilic zone and an outer deeply acidophilic zone which is characterized by the presence of clubbed mycelia. Diagnosis: Chronic inflammatory granulation tissue containing ray fungus compatible with actinomycosis" (fig. 2).

COMMENT

This patient had sulfanilamide, wet dressings, elevation of the left arm and bed rest, which controlled the acute cellulitis that immediately followed the human bite. But he was never given adequate drainage of the infected bite wound area until two and a half years after the chronic infection began. The tissues at the site of the bite wound were almost certainly devitalized by a strong chemical antiseptic immediately after the bite, and there was an acute purulent infection two to five days later. The measures used to control the cellulitis did not control the actinomycotic infection of the injured tissues.

The difficulty in culturing the pathogenic actinomycetes is well known, and our unsuccessful attempt to culture them from the pus is therefore not surprising and does not contradict the diagnosis.[3] In this case the diagnosis of actinomycosis was made in the absence of other causative agents on the basis of the history and on the finding of the typical sulfur granules in the granulation tissue.

Cope and McWilliams each reported one case of actinomycosis following a human bite. Cope's case was similar to the one reported here.[3] Following a human bite of the hand in the soft tissues between the first and second metacarpals, the patient developed a cellulitis which subsided on rest and elevation of the part. Subsequently a chronic inflammation developed in the area, repeatedly suppurating until after several months the lesion was adequately drained and the granulation tissue cleaned out. Actinomycotic granules were found in the granulation tissue. The lesion healed promptly and permanently after the adequate drainage.

In McWilliams' case the actinomycosis started slowly, after a tooth wound of a finger.[4] This infection caused sclerotic and cystic changes in the underlying bone, and the chronic suppuration of the soft tissues discharged through several sinuses. At surgical exploration of this lesion the diagnosis of sarcoma led to amputation of the finger. Postoperative examination of the soft tissues revealed sulfur granules typical of actinomycosis. The bone changes were apparently secondary to the pathologic changes in the soft tissue, for no actinomycetes were found in the bone. No extension of the lesion subsequently occurred.

The actinomycetes are a large and important group of microorganisms that have a very labile morphology.[5] The types that concern the agriculturist are aerobic, while most students of

3. Cope,[8] Colebrook.[10]
4. McWilliams, C. A.: Actinomycosis of Phalanx of Finger, Ann. Surg. **66**: 117, 1917.
5. Wright, J. H.: Biology of the Micro-Organism of Actinomycosis, J. M. Research **13**: 349-404, 1904-1905. Henrici.[1]

actinomycosis have concluded that the anaerobic or microaerophilic Actinomyces bovis of the Wolff-Israel type is the usual human pathogen.[6]

The fundamental growth pattern of the actinomycetes is that of a fungus in which there is an axial filament with true branching. This pattern, under certain environments such as the human mouth, may be modified to a fragmented or bacillary form, as noted by Henrici and others.[7]

Pathogenic actinomycetes are most often recognized in tissue when their branching mycelia form typical clumps, or sulfur granules. In such characteristic colonies the mycelia have developed hyaline caps on their peripheral tips, and these caps or clubs give the sulfur granule its characteristic appearance.

The diagnosis of actinomycosis must not be made on the basis of sulfur granules alone, because other organisms, such as Actinobacillus, can form them too. However, if these sulfur granules, having been crushed, stained and studied microscopically, show basophilic axial filaments with true branching, actinomycosis is the logical diagnosis. Cope stated that from the clinician's point of view "both for diagnosis by smear and for cultural purposes it has proved necessary to isolate the actual sulfur granules from the pus and granulation tissue. Seldom were separate mycelial filaments found in the pus or was a growth of the organism obtained from random samples of pus." [8]

There are two general theories of the mechanism of human actinomycotic infection. The first is the exogenous theory. According to this one the ray fungus is conveyed to man from vegetable sources such as grasses and soil. It is true that actinomycetes are very plentiful in alkaline soil, but a convincing argument against this theory is the fact that actinomycetes found in soil and on grain are predominantly aerobic, while the human and animal pathogen is microaerophilic.[1] Furthermore, typical actinomycosis has not been produced in laboratory animals by aerobic actinomycetes obtained from vegetable sources.[9]

The second, or endogenous, theory of actinomycotic infection does not attempt to explain from what source Actinomyces bovis is originally conveyed to the human body but suggests that it is a normal inhabitant of the mouth and digestive tract.[10] Crowley suggested that "they fill a role analogous to the organisms of Vincent's infection, which are present in the mouth without necessarily causing infection.[11] Sullivan and Goldsworthy think that "they lead a saprophytic existence in the mouth and invade the tissue only when conditions are rendered favorable, as by injury." [12]

Circumstantial clinical evidence which supports the endogenous theory is the coincidence of tooth extractions, particularly from pyorrhetic mouths, with the onset of cervicofacial actinomycosis.

The experimental support of this endogenous theory is recent work by Sullivan and Goldsworthy [12] and by Slack; also previous experiments by Lord, Naesland and others.[9] Slack successfully reproduced actinomycosis in laboratory animals and concluded: [13] "Anaerobic species of actinomycetes have been isolated from carious teeth, tonsils and pyorrhea pus and from the normal mouth. These organisms are not distinguishable morphologically from true agents of actinomycosis and they have similar cultural characteristics. . . . Progressive fatal experimental actinomycosis with sulfur granules was produced in 4 rabbits and 1 guinea pig inoculated with an anaerobic actinomycete isolated from pyorrhea pus."

SUMMARY

1. A case of actinomycosis secondary to a human bite was observed, and 2 similar cases were found in the literature.

2. Actinomycetes indistinguishable from the known pathogenic Actinomyces bovis have been isolated from normal and diseased human mouths by several students of actinomycosis.

3. Experiments show that actinomycetes from the human mouth can cause true actinomycosis in animals.

4. It is logical to suspect actinomycosis in any persistent inflammatory lesion which stubbornly resists treatment, especially if it is at the site of a human bite wound.

5. It would seem from the few cases so far reported that with adequate surgical treatment the prognosis in cases of actinomycosis secondary to human bites is excellent.

CONCLUSION

A human bite can transmit pathogenic actinomycetes and cause actinomycosis.

6. Zinsser, H., and Bayne-Jones, S.: Textbook of Bacteriology, ed. 8, New York, D. Appleton-Century Company, Inc., 1939. Henrici.[1] Lord.[9] Slack.[13]

7. Henrici.[1] Sullivan and Goldsworthy.[12] Slack.[13]

8. Cope, V. Z.: A Clinical Study of Actinomycosis with Illustrative Cases, Brit. J. Surg. **3**: 55-81, 1915-1916.

9. Lord, F. T., in Cecil, R. L.: Textbook of Medicine, Philadelphia, W. B. Saunders Company, 1942, pp. 375-377.

10. Colebrook, L.: Mycelial and Other Micro-Organisms Associated with Human Actinomycosis, Brit. J. Exper. Path. **1**: 197-212, 1920.

11. Crowley, M. C.: Isolation of Actinomycete-like Organisms from Root Canals, J. Dent. Research **20**: 189-194, 1941.

12. Sullivan, H. R., and Goldsworthy, N. E.: Comparative Study of Anaerobic Strains of Actinomyces from Clinically Normal Mouths and from Actinomycotic Lesions, J. Path. & Bact. **51**: 253-261, 1940.

13. Slack, J.: Etiology and Pathogenesis of Actinomycosis, J. Bact. **43**: 193-209, 1942.

A PROCEDURE TO CORRECT FACIAL PARALYSIS

EDWARD M. HANRAHAN, M.D., AND WALTER E. DANDY, M.D.
BALTIMORE

Herein are presented the results of a method of improving the appearance of the face after loss of the facial nerve. For many years the standard procedure for correcting facial paralysis

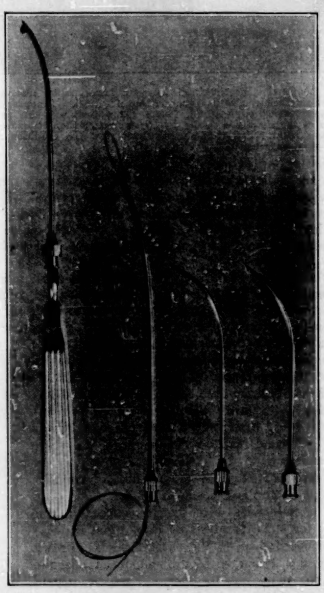

Fig. 1.—Assortment of hollow needles used for introduction of fascia. From left to right, a 12 cm. 11 gage (American standard wire gage) needle with removable handle. Second, a 14 cm. 10 gage needle showing wire loop used to grasp one end of a fascia strip. The two smaller needles, 10 cm., 13 gage, are used about the eye.

had been a spinofacial or hypoglossofacial anastomosis. The results were good but far from perfect. The advent of fascial strips slung from the temporal fascia to the lower and upper lips and to the lower eyelid produced results as good as if not better than the nerve anastomosis. However, each procedure left much to be desired. The nerve anastomosis never produced complete motor function in either the lower part of the face or the lower eyelid and, while in a certain percentage of cases there was automatic muscular control, in most instances the muscular activity was dependent on movement of the shoulder with spinofacial or of the tongue with hypoglossofacial anastomosis. On the other hand, with the fascial strips alone there was no motor activity and a complete absence of tone on the

affected side of the face. The procedure advocated here is a combination of the two procedures, i. e. the nerve anastomosis plus the fascial strips. The two are done at the same operation. The spinofacial anastomosis has been used exclusively. It is, of course, essential that the facial paralysis be of less than a year's duration; after that time return of motor function is not attainable. For paralysis existing over a year only the fascial strips are indicated. In a series of 17 cases so treated the facial paralysis resulted from the total removal of acoustic tumors in 7, from injury to the facial nerve during mastoid operations in 3, from the division of the facial nerve because of unbearable facial tic in three, and from a variety of injuries in 4.

Fig. 2.—Cerebellopontine angle acoustic tumor, right, removed Dec. 2, 1941. Spinofacial nerve anastomosis Dec. 13, 1941. *A*, appearance before fascial suspension on Nov. 28, 1942. The patient was able to move the muscles of the right side of the face by voluntary shoulder movements but there was scant relief of the paralysis at rest. *B*, condition eight days after fascial suspension.

The method of performing the spinofacial anastomosis needs no comment. It has long been a standardized procedure. We prefer the spinal accessory nerve to the hypoglossal because its loss is less obtrusive to the patient. Always one can be certain of return of motor power to the face because end to end anastomosis is made with intact nerves, i. e. without neuromas. The nerve suture is performed first because the field of operation is clean; immediately thereafter the fascial strips are implanted. In 17 cases only 4 were followed by any degree of wound reaction and in only 1 was there a frank infection. It is worthy of note that the latter case, treated with gramicidin, we consider to be one of our best cosmetic results.

The fascial strips were first introduced in this country for facial paralysis by Blair [1] and Brown,[2] who anchored them to the parotid fascia. Brown changed the anchorage to the temporal fascia and passed the strips into the temporal muscle, hoping for some resulting muscular activity. Although it is doubtful that this result is attained we have used this modification, feeling that at least the fixation to the temporal fascia is preferable. The fascial strips are carried across the midline of both the upper and the lower lips and looped through the sound muscle on the unaffected side. If the strips of fascia do not cross the midline they will not hold, and traction of the face will fail.

The temporal muscle flap with secondary attached fascial strips used by Gillies [3] has been tried but with little if any motor function resulting. However, it is not improbable that refinements of this method may yet bring better results.

Preliminary study of the face at rest and with the unaffected side in use will determine the most advantageous point on the paralyzed side at which to locate the nasolabial fold suspension. This point and the points on both upper and lower lips may be tattooed in the skin with a small hypodermic needle dipped in an alcoholic solution of brilliant green. These points will survive the most vigorous preoperative skin preparation and are of great value during the operation.

Anesthesia by intratracheal intubation through the nostril of the unaffected side supplies an airway and leaves the mouth clear for operative manipulation. Recently pentothal sodium has been used almost exclusively.

In obtaining fascia the Bateman stripper has been very satisfactory. It is essential that the longest possible strips be obtained to avoid splicing. It is probably preferable to anchor separately the two ends of the fascial loop from the upper and lower lips to the temporal fascia instead of carrying them through temporal muscle if this step requires a splice. Strips are cut about 1 cm. wide. Two or three may be obtained; they are cleared of any attached fat and split into smaller strips of about 5 mm. width; these are used for the suspension.

The temporal incision is only 5 or 6 cm. long and is placed within the hairline sufficiently posterior as to avoid any nerve fibers to the eyelids or frontalis; the incision ends at the zygoma.

The modified Reverdin needle devised by Blair is not always satisfactory. All too frequently its grasp of the end of the fascial strip is insufficient and necessitates repeated reintroductions with consequent trauma and possible contamination. A simple substitute is very effective. We have used large hollow needles 10 gage (American standard wire gage) and 14 cm. long, pointed and curved as shown in figure 1. To one end is attached a hub into which fits a removable handle. The handle facilitates its manipulation but is not necessary. This needle is introduced in the temporal incision, is pushed through the tissues of the cheek and emerges at one of the previously marked points, where a small stab wound is made. The handle is then removed and a loop of wire is inserted from above and appears through the needle point. One end of a fascial strip is placed in the wire loop, which is drawn backward until the fascia is tightly engaged against the needle opening. By strongly pulling the wire bearing one end of the strip, the needle and fascia are drawn into the temporal incision. The needle is then reintroduced in a parallel course and emerges at the same point, where it grasps the other end of the same strip and in so doing creates a loop of fascia around the orbital muscles of the sound side. Each of the stab wounds in the lips is closed by a single suture. Each end of the strip is now inserted deeply into and out of the temporal fascia and muscle by a Gallie needle, about 1 cm. apart, and tied. The knot is rein-

Fig. 3.—Appearance six months after the combined operation performed for facial tic. *A*, the face at rest. *B*, the facial response on voluntary movement of the shoulder.

1. Blair, V. P.: Notes on the Operative Correction of Facial Palsy, South. M. J. **19**: 116, 1926; Further Observations on the Compensatory Use of Live Tendon Strips for Facial Paralysis, Ann. Surg. **92**: 694, 1930.
2. Brown, J. B.: The Utilization of the Temporal Muscle and Fascia in Facial Paralysis, Ann. Surg. **109**: 1016, 1939.
3. Gillies, H.: Experiences with Fascia Lata Grafts in the Operative Treatment of Facial Paralysis, Proc. Roy. Soc. Med. **27**: 1372, 1934.

forced with a silk suture and the ends are tacked down to the temporal fascia. The temporal attachment may be deferred until the strips have been similarly introduced to the remaining two points. Corresponding fascial ends should be clamped together for identification. The deformity must be appreciably overcorrected, almost to the limit to which the movable tissue can be suspended. The overcorrection has usually adjusted itself by the time the patient is ready to leave the hospital on the tenth day. The excess skin seen in long standing cases should be removed from in front of the ear.

The passage of the needle through the cheek is facilitated by guidance with the fingers of the left hand within the mouth. The use of gauze or preferably a cotton glove on this hand, at this stage, permits better control and avoids perforating the mouth with the needle. Rubber gloves are changed when the intraoral steps have been completed.

The passage of the needle should be midway between skin and mucosa. If too near skin, ridging and puckering result. If too near the buccal mucosa, the fascia may subsequently erode through from pressure against the teeeth. The uppermost strip of the loop to the lower lip should be near the vermilion border; a deeper position causes eversion of the lower lip. The position of the parotid duct must be remembered.

Frequently a 3 mm. tarsorrhaphy at the outer canthus will be sufficient correction for a mild paralytic ectropion. If this condition is more severe the Kuhnt-Szymanowski operation or a fascial suspension of the lower lid, attached to the frontalis fascia as described by Blair, is preferable. The latter is done with a smaller hollow needle and wire loop, as described. A tendency toward a bowstring effect at the inner canthus is lessened by insertion of the fascia twice through the periosteum of the nasal plate by a Gallie needle.

The face is supported by a pressure bandage for a week and thereafter by collodion-gauze strips. Liquid diet and restricted talking are indicated for a week. We have given sulfadiazine by mouth in most cases for about five days, or until we are certain of clean wound healing. Similar precautions against infection are used before operation.

1201 North Calvert Street, Baltimore 2.

STAPHYLOCOCCUS ALBUS OSTEOMYELITIS AND SEPTICEMIA TREATED WITH PENICILLIN

O. CHARLES ERICKSEN, M.D., SIOUX FALLS, S. D.

This article describes the successful employment of the sodium salt of penicillin in a case of Staphylococcus albus osteomyelitis and septicemia, with a description of the technic employed, and comments on the side reactions when the drug was given intravenously and intramuscularly.

REPORT OF CASE

History.—B. M., a white man aged 29, a farmer, was admitted to the McKennan Hospital, Sioux Falls, S. D., on Oct. 10, 1943 with the complaints of weakness, chills and fever and also pain in the right hip. The history of the present complaints was that about three weeks before he took ill with chills, fever and sudden severe pain in the right hip. This completely disabled the patient and he took to his bed. He was given sulfonamides by his local physician with no results. During these three weeks he had steadily lost ground, and he was so weak that he was hardly able to move around in bed and had lost approximately 20 pounds (9 Kg.); he also complained of pain in his muscles and bones and he had headaches.

The immediate past history was that he had contracted a sore throat and he thought he had the "flu." The more remote past history is of no consequence.

Physical Examination.—On entry to the hospital and when first seen by me, the patient appeared acutely ill, toxic and extremely weak. The chief complaint then was pain in the right hip, weakness, chills and fever. The eyes, ears, nose and throat and the heart and lungs were normal. The blood pressure was 110 systolic, 70 diastolic. The pulse ranged from 80 to 110 and the temperature from 101 to 103 F. for the first thirteen days. There was no evidence of cutaneous or subcutaneous lesions at this time. There was no generalized adenopathy.

The liver was not palpable. The spleen was palpable and somewhat enlarged. The patient was emaciated.

The right leg was flexed at the knee and in abduction and was extremely tender on palpation and on pressure over the upper third of the femur.

The urine was normal. Examination of the blood revealed hemoglobin 72 per cent, red blood count 4,160,000 and leukocytes 6,400, with polymorphonuclears 58 per cent. Several blood cultures were made which revealed a growth of Staphylococcus albus in great profusion. No other organisms were ever found in the blood cultures.

X-ray examination revealed a definite area of bone necrosis in the upper third of the right femur.

Clinical Course.—The patient was first given large doses of sulfadiazine, which did not seem to benefit him at all. This medication was continued for four days and then it was changed to sulfathiazole, which was continued up to November 4 without any apparent benefit. On November 1 the patient was given a blood transfusion, which did not seem to do him any good except to pep him up somewhat. Blood cultures were positive for Staphylococcus albus throughout this entire period. All this time he complained of pain in his bones, hips, chest and ribs, and he was hardly able to eat. He was extremely depressed. He was losing ground rapidly.

On November 1 it was noticed that on both legs, the abdomen and the arms there had developed approximately 40 subcutaneous lesions about the size of a pea or a small lima bean. These were painful and bluish red. One of these lesions was opened and, although there was no pus present, on direct smears staphylococci were found, and cultures made of this lesion at the same time revealed a pure growth of Staphylococcus albus.

On the evening of November 4, seventeen days after his entrance to the hospital and thirty-eight days after the onset of the illness, 500,000 Oxford units of penicillin was obtained in the form of the sodium salt. He was given that same evening 49,000 units dissolved in 1,000 cc. of isotonic solution of sodium chloride. This was given over a period of seven hours by the intravenous drip method. The following day the temperature dropped to normal and the patient felt better. He stated that he had a feeling of well being and felt much improved; however, this might have been purely psychic, since he was told that this medicine would probably cure him.

This method of treatment of giving him 49,000 units of penicillin was followed for three days, and it was noticed that the subcutaneous lesions had disappeared within three days and the right femur felt much better; that is, there was no pain on pressure. However, following each injection the temperature would range from 102 to 106.4 F. orally, but the pulse rate would not exceed at any time 90 per minute. This drastic elevation of temperature was not preceded by a chill, and he did not feel at all ill through these periods of elevation of temperature, which lasted for about one-half hour or so and then would subside to 100 F. or below.

On the fourth day he was given the same dose of penicillin within twenty-four hours; it was divided into two doses every twelve hours. This method was continued for three days, and this was not followed by such severe reactions, since only once did the temperature rise to 104 F. and on other occasions rose only to 100, 100.6 and 101 F. It was thought that these febrile reactions were due entirely to the intravenous administration of the drug, so it was decided to give the penicillin intramuscularly every four to six hours in doses of 7,000 to 14,000 units. This was done for the next four days, when the supply of penicillin was exhausted. At no time after the intramuscular route had been decided on did he have any temperature above normal. On the other hand, the temperature from then on varied from 96.5 to 98.6 F., and the patient's condition was greatly improved. His appetite increased and he gained in weight. The subcutaneous lesions had entirely disappeared, and the tenderness in the right femur had disappeared. Blood cultures taken daily following the inception of the penicillin therapy at no time revealed any bacterial growth.

Dr. N. J. Nessa, roentgenologist, reported on November 10 that the right femur showed an apparent calcium deposit in the formerly reported osteolytic area.

On November 18 the patient was allowed out of bed and he walked, feeling well and desirous of going home. On November 19 he was dismissed, feeling well. He had but little complaint of pain in the right hip. He has been seen by me and checked over on three occasions since dismissal from the hospital. The last time was on Jan. 4, 1944, and he felt fine and wanted to go back to work. He had no complaint whatever.

COMMENT

This being the first case in which I have employed penicillin therapy, I feel that the results obtained, to say the least, were miraculous. The patient improved almost instantly and declared that he had a feeling of well being. The febrile reactions in this case, in all probability, were due to pyrogenic substances that were in the penicillin. When the penicillin was given intravenously, violent febrile reactions were obtained, but when it was given intramuscularly these febrile reactions did not occur.

833 South Phillips Avenue.

Special Article

ECONOMICS OF OBSTETRICS

J. D. LAUX
CORNING, N. Y.

At no time in medical history has the economics of obstetric care been of greater importance than at the present. Preserving maternal and infant life and decreasing maternal and infant mortality are vital to the continuation of our nation in the face of the destruction of life wrought by the war.

WHAT BARRIERS TO BETTER OBSTETRIC CARE?

Generally, the barriers to better obstetric care are pictured in glaring statistical terms of which the following are samples:

Nearly a quarter of a million women do not have the advantage of a physician's care at the time of delivery (Inter-Departmental Committee).

Fifty per cent of the mothers who die in childbirth in the United States die needlessly through ignorance, negligence or lack of adequate care (National Committee on Maternal Health).

Physicians estimate on the basis of experience that one half to two thirds of maternal deaths are preventable, that the stillbirth rate can be reduced possibly by two-fifths and that deaths of newborn infants can be reduced at least by one third and probably by one half. This would mean a savings each year of more than 70,000 lives (Technical Committee on Medical Care).

Regardless of the strict accuracy of such claims, their purport has been driven home to the public.

A threefold attack on the problem of better obstetric care is usually recognized:

1. *Medical.*—Raising the quality of medical care through better training, postgraduate education and the discovery of new drugs.

2. *Educational.*—Education of prospective mothers, early selection of a competent physician and public cognizance of good medical legislation.

3. *Economic.*—Better economic status of patients, basically increasing incomes and improving housing, food and clothing as well as the means and method of procuring good care.

The problems in the medical and educational fields are cheerfully referred to those who are competent to deal with them. The problems in the economic field can only be sketched in outline in this paper.

Paper published under the auspices of the Section on Obstetrics and Gynecology.

COST OF OBSTETRIC CARE

What about the cost of obstetric care? One of the items on medical society fee tables from earliest times to the present has been the fee for normal delivery. In studies of medical society fee schedules by the Bureau of Medical Economics of the American Medical Association,[1] which I participated in, out of 384 schedules collected in 1934, 360 listed "normal delivery, one child" with the median average of $25 for the service. Next to home and office visits, this obstetric fee was the most frequently listed item. Out of 539 schedules collected from 46 states in 1937 a total of 491 schedules gave the charge for "normal delivery, one child" with the median minimum fee again at $25. Maximum fees for delivery were given by 105 schedules with the median at $50. Clearly the prevailing charge for the basic obstetric service of normal delivery is around $25.

Whether antepartum and postpartum services were also included in this prevailing fee was not clear, but generally the stated fee appeared to be for delivery only. However, in many cases the minimal fee was considered inclusive of complete antepartum and postpartum care. In fee schedules especially for welfare or indigent cases (established by medical societies in conjunction with county or state relief plans) confinement care is provided for fees of $15 to $25. Occasionally the services for such charges are limited to

Benefit Basis

	Medical Service Plan	Surgical Benefit Plan
Antepartum services:		
First visit (minimal physical)	$ 5	No benefit;
6 visits up to 7th month at $2	12	services payable
4 visits during 8th and 9th months at $2	8	by patient
Delivery:		
Delivery, including two weeks' after care	40	$40
Postpartum services:		
2 visits, 4th to 6th week, at $2	4	No benefit; services payable by patient
Additional services:		
10 urinalyses at $1; 2 Wassermann or Kahn tests at $1; differential blood count at $2 and complete blood count at $4; minimal charge of $18	18	No benefit; services payable by patient
Total benefit	$87	$40

delivery with three antepartum and postpartum visits. As charges for medical care of indigents are generally scheduled at 50 per cent of the prevailing charges, a fee of $30 to $50 was apparently considered appropriate for relatively complete obstetric care.

The determination of a charge for medical services such as home delivery is not subject to cost analysis. Custom, the chief factor in establishment of medical fees, is especially prominent in the fixing of fees for obstetric service. From midwifery (1750) to parturition (1836) to confinement (1900) to obstetric delivery (1930) the fee has been approximately the same.

EVALUATION UNDER MEDICAL SERVICE PLANS

The problem of reaching general agreement among physicians on the evaluation of medical service is particularly apparent in the development of prepayment medical service plans. The traditional "sliding scale" of fees, by which charges are varied according to the patient's ability to pay, has formed extremely heterogeneous ideas as to the proper charge for a service. Yet in actual practice there is a surprising uniformity of charges. Fees for usual services such as obstetric

1. Leland, R. G.: Medical Fees for Obstetric Service, J. A. M. A. **113**: 1331 (Sept. 30) 1939.

delivery do not vary except in broad social-economic groups such as (1) indigent, (2) middle class, (3) wealthy. Persons in the middle class, which constitutes at least 70 per cent of the physician's clientele, are usually charged about the same fee, especially in urban areas where the income status of the patient is not well known by the physician. It is the impact of this changing relationship between physicians and patients that is bringing greater attention toward methods of prepaying or financing medical charges.

A review of schedules of payment for obstetric services under prepayment plans sponsored by medical societies indicates that a fee of about $40 is established for the low income group, that is, those above the indigent subsistence level but below the comfort level of $2,500 annual income per family. Persons enrolled whose income is above this limit are obligated to pay the physician's additional charge, if any. Likewise all antepartum and postpartum services are paid by the patient. In some few plans providing full medical services (antepartum and postpartum visit fees plus charges for urinalyses and blood studies in addition to the delivery) the payment amounts to at least $87. The benefit basis for one such plan is given in the accompanying table. Providing benefits under the extended medical plan only for services actually rendered was believed an inducement to more complete obstetric service. Some plans limit the benefit for the complete confinement care to a flat amount such as $50 without regard to the amount of service rendered.

WHY AN ECONOMIC PROBLEM?

On the surface it would appear that the relatively low fee of about $25 for obstetric delivery would not cause any economic problem except for indigents. However, the depth of the problem is indicated by the fact that prepayment plans offering $40 for delivery alone with the patient to pay for antepartum and postpartum services, or even the $85 payable for complete care under medical plans, still cause general disquietude among physicians. Underlying is the question of differential fees for services of obstetricians as compared with general practitioners.

The level of fees charged by specialists in obstetrics is not generally recorded, but some evidence, from bills rendered patients under hospital and medical service plans, indicates that $100 would be the prevailing charge to patients in the middle class group. There is no disputing that the services of an obstetrician for complete confinement care of patients in this group is properly valued at $100 to $150 in comparison with the minimal services so frequently rendered in general confinement care for charges of $25 to $50.

The problem is to assist more and more patients to obtain services such as rendered by obstetricians. Or, to state it more exactly, a place in the family budget should be made for more adequate obstetric care, thereby making possible the support of more fully trained obstetricians or more complete care from well trained general practitioners.

An interesting sidelight on the ability of patients to obtain the services of obstetricians is shown in a tabulation of the type of practitioner performing the first 1,220 deliveries under Michigan Medical Service, a prepayment plan sponsored by the Michigan State Medical Society. Of these deliveries only 12 per cent were performed by physicians limiting their practice to obstetrics. On the other hand, 84 per cent of the deliveries were performed by general practitioners. Worthy of note is that the remaining 4 per cent of the deliveries were performed by specialists limiting their practice to a particular field other than obstetrics! Even when the bill is paid, patients obviously still wish to obtain services from physicians they know and in whom they have confidence rather than from practitioners who may have greater technical skill. Furthermore, there are too few obstetricians to care for more than a fraction of all deliveries. With less than 1 per cent of physicians, or a total of 1,700, limiting their practice to obstetrics and gynecology, it would be rather remarkable for them to take care of more than 12 per cent of the deliveries. With only one obstetrician-gynecologist for approximately 80,000 persons, each such specialist would have to perform about 1,600 deliveries annually to render all obstetric service. There is a larger group, constituting about 4 per cent of the total number of physicians, or some 6,800, devoting special attention to obstetrics and gynecology. However, it is apparent that the majority of normal deliveries will have to continue to be performed by general practitioners.

There are, of course, other expenses such as hospitalization, nursing and layettes which build up the economic problem of obstetrics. One study of what parents paid for 540 babies [2] reported an overall average cost of $110, ranging from $270 where parents are in comfortable circumstances (above $3,000 annually) to $129 for those earning $1,200 to $3,000 and $64 for those less than $1,200. The highest cost was $692.

It is undoubtedly the fact that total expenses in connection with obstetric care run into three figures, which focuses emphasis on the charge by the physician.

Much attention has been given to alterations in the present system of distributing and paying for medical care. However helpful such proposals may be toward meeting the cost of actual medical care, no amount of change in the present system of medical practice will affect the really basic economic problem of sufficient income to make possible an adequate standard of living —food, housing and clothing as well as medical care. The direct approach of bolstering individual and family incomes is apparently too simple for social reformers. However, it must be granted that there are real imponderables to overcome before all workers' incomes can be increased so they can afford a higher standard of living. Yet, the furor over socialization of medicine as a palliative means of improving the distribution of medical care should not be allowed to obscure the plain fact that the common living essentials such as food and housing and economic security are frequently more vital to good health than medical care. When experiments such as those in England show that improvements in the nutrition of expectant mothers reduced maternal mortality by almost one-half that existing among a control group of mothers not receiving additional food, the prospects of improving the distribution of such an essential should not be forgotten.

One aspect of maternal mortality where medical science is perhaps overshadowed by economics is that of maternal deaths due to abortion. It has been fairly authentically determined [3] that 3,300 maternal deaths, 35 per cent of all maternal deaths, are due to abortion. The medical causes and possibly correctives of abortions have been extensively catalogued and analyzed. The

2. Mark, M. L.: What 540 New Citizens Cost in Columbus, Survey Graphic **16**: 386 (Jan.) 1930.
3. Dunn, Halbert L.: Vital Statistics—Special Reports (1941), United States Department of Commerce, Bureau of the Census, 1943, vol. 15, p. 431.

somewhat more basic economic factors such as poor nutrition, improper housing and overexertion in connection either with housework or with work in the office or factory cannot be as readily diagnosed or treated. These economic conditions perhaps in conjunction with a nervous-mental burden of unplanned pregnancies can overcome even the best obstetric care. Coupled with the fact that under such circumstances medical attention is too frequently delayed or not obtained, it is remarkable that the death rate because of abortion is not greater.

The medical profession is currently struggling with the question of child spacing. On the one side is a group of physicians who, perhaps because of religious belief or age, are unalterably opposed in their thinking to any condoning of artificial contraception. On the other side is a group of as equally distinguished physicians who urge dissemination of contraceptive information and devices. Because of moral implications, artificial contraception will probably always be a controversial subject. However, prominent physicians and church leaders have agreed that the natural rhythm method (Ogino-Knaus) of child spacing can be effectively utilized. Further substantiation of the scientific-medical basis of the rhythm method may be desirable, but it is believed that a simplified visual method of calculating rhythm periods is more acutely necessary before wide usage of this method will be possible. Undoubtedly the effect of child spacing on the underlying socioeconomic problems would help to overcome pregnancy wastage shown by the large number of stillbirths, neonatal deaths and abortions and would also help to reduce maternal mortality and morbidity.

With the large number of women now employed in war industries it is hoped that the economic factors of obstetric care will receive more proportionate attention. No really valid criticism can be maintained against the medical progress toward better obstetric care. Further progress awaits the development of the educational and economic factors connected with obstetric care.

MONEY VALUE OF HUMAN LIFE

A digression into the realm of so-called higher economics may be of interest. There has been considerable general speculation on the value of a human being. Usually these speculations end with the much quoted calculation that the chemical elements of the human body are valued at 69 cents. Most economists have hesitated to give any estimate of the money value of man. Some have taken the position that people are not to be counted as wealth because they are the reason for which wealth exists. Others incline to the position that human values should not be included in national wealth because the average lifetime consumption of a person approximately equals his production. A third class omits all approximations of human life values because of the difficulty of any accurate statistical measurement. However, there are economists who maintain that human life should be valued in cash to give a realistic picture of the total economic structure of a nation.

Placing a money value on human life is also desirable to give a commonly understood expression to the savings possible through conservation of life. Avoiding metaphysical or sentimental ideas, the economic value of an individual is measured by his earnings as a productive worker during his lifetime.

The only recognized economists who have attempted a cash estimate of human life have been Alfred Marshall and Irving Fisher. Marshall's estimate of $2,700 applied to Englishmen in 1895. Fisher's estimate of $10,000 for Americans was made in 1910. In the insurance field the value of life is closely related to the present worth of future earning. On this basis, Dublin and Lotka [4] estimated the value of a child at birth from $3,000 to $16,050, depending on the income class of maximum earnings. There are other money values placed on human life, such as prices paid for slaves ranging from $21 to $2,000 and court awards for death damages ranging from $1,500 to $70,000.

Using the discounted value of net future earnings (that is after deducting the expenses of raising a child) for the median income of $2,000 annually, it is fairly accurately estimated that the value of a child at birth is $9,000 and at 21 years of age $30,000.

Relating these valuations of human life to obstetric fees, it can be seen that the charge for delivery is only ¼ to ½ of 1 per cent of the value of the child at birth. In relation to the value of the lives of both the mother and child, the obstetric charge is only 1/10 of 1 per cent. The tremendous importance of decreasing maternal mortality purely from the economic point of view is evidenced by the fact that each year about $250,000,000 is the value of maternal lives lost. Likewise the savings possible through decreasing infant mortality could amount to $1,600,000,000. The assets of the United States are too commonly measured in terms of factories, lands and minerals. The greatest assets are the men, women and children. In fact, human beings are to be valued in terms of productive capacity at five times the value of all the material assets of the nation—including the recent valuation made by Mr. Ickes.

All this indicates the key position that good medical care and especially good obstetric care plays in the economic status of the nation.

GOVERNMENT PROGRAMS

Increased attention to medical service, especially maternal care, as a field for organized action on the part of government agencies is apparent. The acceleration toward more government participation in payment of medical services began with the appropriation of $22,200,000 for Health and Welfare Service under the Social Security Act, of which $5,820,000 was specifically for maternal and child health. In a sense, the old Shephard-Towner Act of 1921 bringing the use of federal funds into the field of maternity and infancy was renewed—after a two year revival—in 1927. This time the allotment of federal funds for maternal and child care was firmly entrenched under the supervision and control of the Children's Bureau.

Total government expenditure for health, including state and federal funds, is placed at $706,900,000 for 1941 by the Social Security Board,[5] which amount is 11 per cent of the total Social Security and related programs. However, this is an understatement of government outlay for health, since expenditures for medical care incidental to other programs such as those in connection with Army, Navy, Education and Farm Security Administration are not included. Of this huge governmental medical financing, $9,300,000 is especially allocated for maternal and child health services.

With the policy of grants-in-aid established, there is little likelihood that state legislatures will abandon use of federal funds available when combined with state

4. Dublin, L. I., and Lotka, A. J.: Money Value of a Man, New York, Ronald Press, 1930.
5. Social Security Year Book, Federal Security Agency, Social Security Board, 1941, p. 37.

funds. Under such a pattern for distributing payments for medical services, it seems that the medical profession would be well advised to devote attention to professionally sponsored agencies for administering these medical funds. This is almost as important for the good of the patient as the scientific methods of diagnosis and treatment.

It is of particular significance that the most recent extension of government payment for medical care was to pay for the obstetric-pediatric care of wives and children of servicemen in the fourth ($78 per month) to the seventh grades ($50 per month). An appropriation of $4,400,000 for this purpose has been granted to the Children's Bureau for the fiscal year ending June 30, 1944. Another appropriation bill, H. R. 2041, is designed to continue this obstetric-pediatric program for the duration and six months after the war with an annual appropriation of $6,000,000. However, the plan of paying for obstetric care of the wives of servicemen was quietly started under the Maternal and Child Health program of the Children's Bureau on request from state health agencies. From August 1942 to February 1943 over $390,000 was expended for this purpose. Already forty-three states and territories have programs approved by the Children's Bureau under the new separately financed program. Between March 1943, when this program started, and August 1943, 29,910 soldiers' wives had received "free maternity care." Payments, which are generally administered through state health departments, provide $25 for delivery, $10 for antepartum care and laboratory, and $5 for postpartum care and laboratory, or $40 for confinement. A like sum of $40 is payable for hospitalization. Approximately 5 per cent of all births, or at least 70,000 annually, are expected by the Children's bureau to be cared for under the program.

In several states the medical profession has pointed out that payments for this purpose should be added to the servicemen's family allotment, thereby eliminating the need for a new fund distributing agency of the government. Another concern of the medical profession is to keep the determination of the amount of fee for the service an individual matter between the patient and the physician. Hence the request that payments be made to servicemen's wives as supplemental funds. However, the payment is allowable only on receipt of obstetric-pediatric care, and the Children's Bureau apparently considers the wives of all servicemen below the rank of a commissioned officer eligible for the care with the entire payment to be made from government funds at the stipulated fee.

Here again is need for a professionally sponsored agency to handle the administration of funds for medical care. Note in particular that plans for this program were to be developed and administered by state health agencies. Fortunately there is some tendency for even federal government proposals to take the shape of furnishing necessary funds with the distribution of payments and arrangements for medical services by voluntary nonprofit agencies. For example, the Farm Security Administration has so financed 1,044 medical care programs which provide service, including obstetric care, for 613,054 persons through voluntary and usually medical sponsored and administered agencies. Likewise the National Resources Planning Board proposals for extension of Social Security stress financial aid to states through cooperation with the medical profession in plans to help patients pay medical expenses on a budget prepayment basis. This program has been translated into proposed legislation by the Wagner-Murray-Dingle Social Security Bill (S. 1161 and H. R. 2861), which grants the Surgeon General authority to negotiate both the method of payment and the fees with private agencies.

There is no question about the magnitude of the decision facing the medical profession on the economic front. Two courses are open: (1) to oppose use of government funds in medical care except for care of the indigent sick; (2) to accept use of government funds in medical care for those above the indigent level provided the medical profession has full voice in decisions concerning the distribution of such funds.

From the economics of the problem, it is my conclusion that such funds should be used under sound plans sponsored by the medical profession.

VOLUNTARY PROGRAMS

The turning of government from the provision of actual medical service to programs whereby the funds are furnished by government with the distribution of payments and arrangements for service made by private agencies is primarily due to the growing success of voluntary nonprofit prepayment plans. Such plans organized on a state or regional basis, under sponsorship of the medical profession, permit payments to all qualified physicians and endeavor to let the subscriber receive medical service in essentially the same manner as prior to organization of the prepayment plan.

There are thirty-three such plans in operation in fifteen states providing services for more than 750,000 persons. Similar plans are being proposed in twenty-one areas in sixteen other states. Likewise there is a plan in Hawaii (it survived Pearl Harbor) and four in Canada. A Medical Service Plans Council for these plans has been formed to coordinate and stimulate an exchange of administrative and statistical experiences.

Continued expansion of voluntary plans, both hospital service and medical service, is becoming of ever greater significance to the private practice of medicine—especially obstetric practice. Conversely, the importance of obstetrics to prepayment plans is indicated by the statement of an actuary of a large hospital service plan that "maternity utilization is the best single index of the financial condition of a hospital service plan." The same is also true for medical and surgical service plans. Under such plans, maternity cases (including complications of pregnancy, childbirth and the puerperium as well as deliveries) rank first in number and in cost.

Most medical service plans have striven to lift the quality and quantity of obstetric care by providing a fee which would encourage more adequate care from general practitioners and yet fairly recompense the obstetrician for his services. Even under the limited surgical plans the delivery fee of $40 assures the general practitioner more than the average for complete care. This, with the opportunity for some additional payment by the patient for antepartum and postpartum care, should give an impetus for even more adequate care. Likewise the $40 delivery fee does not prevent the obstetrician from receiving proper recompense of $100 to $150 for his extensive care.

Some plans specifically provide a higher fee for physicians who limit their service to obstetrics but may

provide that the patient must be referred by a general practitioner before the case can be considered as warranting a specialist fee. An accompanying provision is that no payment will be made to a specialist for services outside his field of specialization. Where these or similar arrangements under medical society sponsored plans are formulated by committees of physicians thoroughly familiar with the professional problems involved, it is surprising the amount of heat that is generated by practical application under a functioning plan. Nevertheless, medical societies should be able to develop a workable plan which will win the support of the majority of physicians.

The obstetric-gynecologic experiences under the Surgical Benefit plan of Michigan Medical Service gives an interesting picture of the possibilities of prepayment. For an average cost of 61 cents a month per person (60 cents for single subscriber, $1.60 for two persons and $2.25 for family including all children up to 18 years) the subscribers are entitled to practically unlimited surgical and obstetric procedures for hospitalized conditions. Participating physicians render these services without additional charge beyond the payment by the plan if the subscriber's family income is less than $2,500 annually. Subscribers with greater incomes are obligated to pay the physician the difference, if any, between his usual charge and the payment from the plan. The benefits paid by the plan are fully equivalent to the prevailing charge for the service. As examples: delivery, $40; cesarean section, $100; ectopic pregnancy, $125; perineorrphy, $50; rectovaginal fistula, $100; dilation and curettage, $25; hysterectomy, vaginal $125, abdominal $150; oophorectomy, $100; ovariotomy, $75, and salpingectomy, $100.

On the basis of several years of operation representing over 3,500,000 member months of experience, the following points seem to be confirmed:

Obstetric services (including normal delivery, cesarean section, ectopic pregnancies and miscarriages) are required by 20 per cent of the patients and represent 19 per cent of total payments.

Normal deliveries at 24 per thousand subscribers annually is about 1⅓ times that for the general population.

Average obstetric payment is $42.50 including, besides the $40 payment for normal delivery, payments for cesarean and ectopic operations.

Frequency of obstetric and gynecologic operations is in the following order: 1. Suspensions. 2. Hysterectomies. 3. Salpingectomies. 4. Dilations and curettages. 5. Deliveries (including normal, cesarean, ectopic and miscarriages). 6. Oophorectomies. 7. Ovariotomies.

Gynecologic operations (female, abdominal and pelvic) are required by 12 per cent of all patients and represent 22 per cent of total payments.

Gynecologic specialists cared for 3 per cent of all patients and received 5 per cent of total payments.

The average gynecologic payment is $100.

Of the 61 cents per month paid by each subscriber, 52 cents is paid to the physician for services and 8 cents is used for administration, leaving 1 cent for reserves.

Obstetric and gynecologic services together represent 41 per cent of the total cost of all services (12 cents a month per person for gynecologic and 10 cents a month per person for obstetric services).

In Mr. Churchill's words, "the magic of the averages to the rescue of the millions" is shown by the fact that 10 cents a month per person will pay for all obstetric deliveries at fair fees (as has been indicated) and that 12 cents a month per person will also provide fair fees for all gynecologic corrective and restorative operations. Including administration expenses, the total cost of 30 cents a month per person, or about $15.35 a year per family, would afford full access for every family to the benefits of essential and greatly needed obstetric and gynecologic surgery services.

It remains for the medical profession to formulate workable programs embodying the prepayment principle.

SUMMARY

The barriers to better obstetric care are more largely economic and educational than medical.

Physicians' charges for the obstetric service of normal delivery are generally nominal amounts of $25 to $50. Yet, in connection with the expenses of specialists' services, hospitalization and nursing, an economic problem does exist in obstetric care. The problem is to find a place in the family budget for the support of more fully trained obstetricians or more complete care from well trained general practitioners.

A monetary valuation of a newborn child at $9,000 and of an adult at $30,000 indicates a loss due to maternal and infant deaths of close to $1,850,000,000 annually—demonstrating the importance of good obstetric care in the economic status of the nation.

Government participation in payment for medical services, particularly for obstetric care, is definitely increasing. The medical profession is facing the decision of either opposing use of government funds except for the indigent sick or accepting government funds, provided the profession has full voice in the decisions concerning arrangements for distributing such funds. The economics of the problem point toward utilization of government funds under sound programs advanced by the medical profession.

Voluntary, nonprofit, prepayment medical plans are becoming of ever greater significance to the private practice of medicine—especially obstetric practice. The prospects for obstetric-gynecologic practice under prepayment is shown on the basis of experiences with the Michigan Medical Service plan, where $15.35 a year per family provides extensive obstetric-gynecologic surgery and fair fees for the physicians.

No amount of change in the present system of distribution and payment for medical service will affect the basic economic problem of sufficient income for every worker to make possible a higher standard of living—food, clothing and housing as well as medical care.

65 East First Street.

Food Requirements.—Food requirements vary with age, sex, weight and surface area, the last being perhaps of greatest importance. Since the determination of surface area is somewhat difficult it is usually believed to be sufficiently accurate to employ the standard tables of caloric requirements per kilogram of body weight in computing the total diet needs. These requirements are, roughly, at rest, 25 to 30 calories per kilogram (2½ pounds); at light work, 35 to 40 calories per kilogram; at moderate work, 40 to 45 calories per kilogram; at hard work, 45 to 60 calories per kilogram. Most food requirement tables state that children from 6 to 16 need approximately 50 to 90 per cent of the food needed by an adult male at moderate activity.—The Hospital in Modern Society, edited by Arthur C. Bachmeyer and Gerhard Hartman, New York, Commonwealth Fund, 1943.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. HOWARD A. CARTER, Secretary.

SATURATED AIR FEVER THERAPY UNITS ACCEPTABLE

Manufacturer: Equipment Service Company, 915 Behan Street, Pittsburgh.

The Saturated Air Fever Therapy Units are designed to produce temperature rises either in the whole body by general application or in the arms, legs or back by local applications. The units are of three types: the one for general application accommodating the entire body except the head, and two types for local applications, the one for treating the torso and the other for treating the extremities.

The fever therapy box contains an air conditioning system of the general dew point type in which a highly atomized water spray in the upper end of a small duct supplies both the motive power for circulating air and the heat and moisture for saturating it at the desired temperature.

A water temperature of 130 F. will produce a uniform saturated atmosphere of from 120 to 125 F. Since the air is saturated on entering the box and loses heat before being returned to the air conditioning part of the cycle, saturation is insured throughout.

The unit was examined by the Council, and it was found to be a practical apparatus for administering fever therapy. The comfort, safety and quality of the heat given by this source of saturated moist air was found satisfactory.

The Council on Physical Therapy voted to accept the Saturated Air Fever Therapy Units for inclusion in its list of accepted devices.

BELTONE HEARING AID, MODEL 603H, ACCEPTABLE

Manufacturer: Beltone Hearing Aid Company, 847 West Jackson Boulevard, Chicago.

The Beltone Hearing Aid, Model 603H, is a vacuum tube instrument consisting of a transmitter with a crystal microphone and a large crystal receiver, and a battery unit. The device was examined by the Council and the results of that examination are as follows:

Beltone Hearing Aid Model 603H.

Weights and overall dimensions of the various parts: transmitter, 3¼ inches by 2¼ inches by ¾ inch; weight with cords and receiver, 6 ounces. Crystal receiver, 1 inch in diameter. Batteries weigh 11 ounces. The total weight of the entire instrument is 17 ounces.

Batteries.—Voltages and current drains are as follows:

A-battery, 1.5 volts; current drain at ½, ¾ and full volume, 82 milliamperes. B-battery, 45 volts; current drain at ½, ¾ and full volume, 1.0 milliampere. The set may be used with a 1.5 volt A-battery and a 22½, 33 or 45 volt B-battery. All tests were made with the 45 volt battery.

All required data have been furnished by the manufacturer, such as description, amplification graphs, guaranty certificate, instructions for use and list of servicing agencies. The service plan as described is satisfactory.

Acoustical Gain.—(Average of observations of two trained observers using fitted ear molds seated 5 feet from loud speaker delivering frequencies of pure sine wave characteristics.)

Volume Control	Frequency						
Set at	256	512	1,024	1,448	2,048	2,896	4,096
½	3	12	12	16	15	9	7
¾	7	17	17	18	20	18	24

Physical and Mechanical Features.—The instrument consists of a black molded plastic case of pleasing appearance and is apparently sturdily built. A single control consisting of a plastic disk 1 inch in diameter and 3/16 inch thick serves both as the off and on switch and the volume control. No attempt is made to modify the frequency response.

Performance.—In general the performance of the instrument is good and quite as represented. There is a minimum of internal noise and practically no feedback squeal. At maximum intensity some distortion develops, but for any practical purpose this maximum intensity would not be necessary.

The Council on Physical Therapy voted to declare the Beltone Hearing Aid acceptable for inclusion in its list of accepted devices.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Secretary.

DIPHTHERIA TOXOID, TETANUS TOXOID, ALUM PRECIPITATED, COMBINED (See New and Nonofficial Remedies, 1943, p. 549).

The following additional products have been accepted:

GILLILAND LABORATORIES, INC., MARIETTA, PA.

Combined Diphtheria-Tetanus Toxoid, Alum Precipitated: 1 cc. and 10 cc. vials in packages of two 1 cc. vials and of one 10 cc. vial.

LEDERLE LABORATORIES, INC., PEARL RIVER, N. Y.

Refined Diphtheria-Tetanus Toxoid, Alum Precipitated: 1 cc. and 10 cc. vials in packages of two 1 cc. vials and of one 10 cc. vial.

PARKE, DAVIS & CO., DETROIT

Diphtheria-Tetanus Toxoid (Combined): Packages of three 2 cc. vials and packages of one 30 cc. vial.

SHARP & DOHME, INC., PHILADELPHIA

Combined Diphtheria-Tetanus Toxoid, Alum Precipitated: 1 cc. and 10 cc. vials in packages of two 1 cc. vials and of one 10 cc. vial.

ESTROGENIC SUBSTANCES (See New and Nonofficial Remedies, 1943, p. 401).

The following dosage forms have been accepted:

CHEPLIN BIOLOGICAL LABORATORIES, INC., SYRACUSE, N. Y.

Ampule Solution of Estrogenic Substance (in oil): 1 cc. size containing the equivalent of 2,000 international units per cubic centimeter, 5,000 international units per cubic centimeter, 10,000 international units per cubic centimeter or 20,000 international units per cubic centimeter of estrone in sesame oil with benzyl alcohol 3 per cent.

TUBERCULINS (See New and Nonofficial Remedies, 1943, p. 565).

The following dosage form has been accepted:

PITMAN-MOORE COMPANY, INDIANAPOLIS

Tuberculin (Diagnostic): Packages containing three 1 cc. diaphragm stoppered vials of tuberculin, one of each dilution 1:100, 1:1,000 and 1:10,000. Preserved with 0.5 per cent phenol.

MENADIONE (See New and Nonofficial Remedies, 1943, p. 619).

The following dosage forms have been accepted:

JOHN WYETH & BROTHER, DIVISION WYETH INCORPORATED, PHILADELPHIA

Ampul Menadione (in corn oil) 1 mg. per cc.: 2 cc.

Tablets Menadione: 1 mg.

AMYTAL (See New and Nonofficial Remedies, 1943, p. 481).

The following dosage form has been accepted:

ELI LILLY AND COMPANY, INDIANAPOLIS

Tablets Amytal: 32 mg.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 North Dearborn Street - - Chicago 10, Ill.

Cable Address - - - - "Medic, Chicago"

Subscription price - - - - - Eight dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, APRIL 8, 1944

CONFUSION CONCERNING SHOCK

The term shock has been loosely applied to a number of apparently unrelated conditions. Many regard it as a state of acute circulatory failure characterized by prostration, apathy or stupor, tachycardia, feeble regular pulse and diminished blood pressure. The effects of syncope, fright, exhaustion, anesthesia, hemorrhage, primary shock, cardiac failure or secondary shock conform to this broad application of the term.

The attention of surgeons is focused on shock following trauma. Some of them recognize [1] that at least three mechanisms may cause low blood pressure after injury. One of these, primary or neurogenic shock, is a neurovascular reaction like that of syncope or fainting. This develops promptly after injury and is usually transient unless accompanied by extensive trauma or hemorrhage. Occasionally primary shock may merge gradually into secondary shock without an interval of partial recovery. Recent experiments [2] indicate that hemoconcentration is not present in primary or neurogenic shock.

Low blood pressure may develop promptly from voluminous hemorrhage or gradually from slow or repeated small hemorrhages. The clinical signs of hemorrhage are like those of secondary shock, but it has been shown [3] that they differ in other important particulars. Hemorrhage is followed by rapid dilution of the blood which, in otherwise normal subjects, is proportional to the volume of blood lost. Low blood pressure occurring shortly after trauma is due chiefly to neurogenic and hemorrhagic effects.

The third mechanism results from deranged capillary function. Products of tissue autolysis or of infection, absorbed from damaged tissues, produce systemic effects like those of capillary poisons. Consequent leakage of fluid from the blood into the tissue spaces disturbs fluid balance, lowers the blood volume and causes hemoconcentration. Decreased blood volume, combined with an increased volume capacity of the capillary bed, causes circulatory deficiency. This mechanism requires time for development; it is never seen immediately after injury and hence is called delayed or secondary shock.

Recent reports both by English and by American authors indicate confusion in attempting to analyze the causes of low arterial pressure after traumatic injuries. Data were collected on hemoconcentration, blood volume, blood pressure and other clinical features, but these items showed little uniformity. The injuries described varied widely in character, in severity, in amount of blood lost and in other features. Obviously it is difficult to correlate such various items into a logical picture.

A few causes for bewilderment are apparent and should be eliminated. Cases of traumatic injury present varying combinations of neurogenic shock, hemorrhage and secondary shock, each characterized by low arterial pressure. The importance of these items varies from case to case, and a formula has not yet been devised by which their relative weight in such a combination may be evaluated.

Circulatory deficiency following trauma may be due to neurogenic reactions, to the effects of hemorrhages, to absorption of toxic products or may be due in part to each. Traumatic shock is not a disease entity but a syndrome; it represents the summative effects of several factors. These vary in different cases and in the same case at different times. Obviously the mechanisms involved in shock from trauma should be studied separately as neurogenic, hemorrhagic, toxemic and perhaps other factors.

Continued efforts to explain traumatic shock on the basis of a single mechanism prolong the confusion. The recognition of several contributory causes, including toxemic factors, will go far toward establishing agreement. Investigations on other features of shock may then go forward in an atmosphere somewhat cleared of controversial discussions.

The basic principles on which agreement seems possible are as follows: Surgical shock, like that resulting from extensive trauma, is not due to a single cause but to a combination of causes: the anesthetic, the local loss of blood and fluid, emotional and neurogenic reactions, infection or intoxication which may have reduced the patient's physiologic state, the disease itself which necessitated operation, and toxic products of autolysis or of infection absorbed from traumatized tissues. The relative importance of these factors varies in different cases and they operate in varying combinations. Some of these factors are lacking in shock from other causes.

The occurrence of secondary shock is not limited to traumatic injuries, burns and the aftermath of extensive surgery. Similar circulatory deficiency may develop incident to abdominal emergencies, severe infections,

1. Blalock, A.: Principles of Surgical Care, Shock and Other Problems, St. Louis, C. V. Mosby Company, 1940.
2. Phemister, D. B., and others: Afferent Vasodepressor Nerve Impulses as a Cause of Shock, Ann. Surg. **119:** 26 (Jan.) 1944.
3. Moon, V. H.; Morgan, D. R.; Lieber, M. M., and McGrew, Donald: Similarities and Distinctions Between Shock and the Effects of Hemorrhage, J. A. M. A. **117:** 2024 (Dec. 13) 1941.
4. Moon, V. H.: Shock: Its Dynamics, Occurrence and Management, Philadelphia, Lea & Febiger, 1942.

intoxications such as icterus gravis or eclampsia, and from the effects of anoxia and of various poisons. In such instances, neurogenic shock and the effects of hemorrhage usually are not present; toxic factors are of major importance, and the mechanism is probably that of capillary relaxation and endothelial permeability.

CLINICAL THERMOMETRY

How long does it take a clinical thermometer to record body temperature accurately? The answer apparently is not known by all those who use this instrument of precision, according to DeNosaquo, Kerlan, Knudsen and Klumpp.[1] In order to learn what schools of nursing are teaching with respect to taking temperatures, a questionnaire was sent to one hundred outstanding schools. According to the replies, twenty-seven schools taught their students that the time required for accurate registration was less than three minutes, thirty-seven stated three minutes and only five recommended an interval longer than three minutes. Many clinical thermometers on the market bear such designations as "½ minute," "1 minute" or "60 seconds," which obviously suggests to the user that the time required to register body temperature is that inscribed on the instrument.

The authors conducted a clinical and physical study to determine, first, how long it takes instruments of various makes and types to record body temperature and, second, whether or not there is any consistent difference between instruments bearing different time designations. On the basis of a series of observations, the validity of which was statistically controlled, the authors concluded that an insertion time of three minutes should be the minimum interval for oral clinical thermometers under ordinary conditions of use. It was also found by them that variations in the configuration of the bulb made no appreciable difference in the time required to reach the final reading. Similarly the time stamped on the thermometer did not have any relation to the length of time required by the instrument to reach equilibrium, and in all circumstances a longer time was needed to give an accurate reading than that imprinted on the thermometer to give an accurate reading.

In view of these observations it would seem to be a good thing for thermometer manufacturers to eliminate from their instruments time designations, which can only be misleading and result in serious diagnostic and therapeutic misimpressions.

There is no instrument of precision that is more valuable in the diagnosis and prognosis of disease than the clinical thermometer. It is therefore essential that it be given sufficient time to record accurate information. There is a temptation these days to rush everything; but when it comes to taking temperatures it is the course of wisdom to make haste slowly.

1. DeNosaquo, N.; Kerlan, I.; Knudsen, L., and Klumpp, T. G.: The Clinical Use of Oral Thermometers, J. Lab. & Clin. Med., February 1944.

PRIORITY IN THE DISCOVERY OF FEVER THERAPY IN PSYCHOSIS

Priority for the use of malaria and relapsing fever in the treatment of dementia paralytica, according to Neymann,[1] should belong to Rosenblium. In 1876 Rosenblium [2] purposely infected psychotic and demented patients with relapsing fever; in the same year he published his observations that malaria frequently produces remissions in mental diseases. Zakon [3] has furnished a translation of Rosenblium's original article, together with a photostatic copy of the Russian journal in which the paper appeared. The original is to be found in the Surgeon General's Library. A partial German translation of Rosenblium's article, by Oks,[4] was published in 1879. The latter article attracted the attention of Dr. Peter Bassoe of Chicago, who in turn supplied the information to Dr. Neymann.

As chief of staff of the Odessa Psychopathic Hospital, Rosenblium had many opportunities to observe the effect of intercurrent febrile disease on various psychoses. In his review of such literature as was available to him, Rosenblium mentions among others Leidesdorf,[5] who states "From personal observations I must conclude that febrile disease decreases the degree of psychic disturbance and that this action continues long after the cessation of the fever." This quotation assumes particular significance in view of the fact that Wagner-Jauregg,[6] whose paper on "Prevention and Treatment of Progressive Paresis with Artificially Induced Malaria" in 1931 won him the Nobel Prize, worked as assistant in the psychiatric clinic of Leidesdorf during the years 1883 to 1889.

Rosenblium's report is based on observations on the effect of fever on psychoses in 32 cases; in 21 of these the psychosis was cured, in 3 the condition improved and in 8 it remained unchanged. Eight of the patients who were cured had far advanced melancholia; the others had various chronic forms of insanity. The author states that "the number of recoveries may seem too high, and I admit that some of the patients may relapse into their former state. It is possible too that some of the patients might have recovered without fever. However, although mindful of these possibilities, I still insist that febrile disease has a curative effect on the psychoses. This fact seems well proved."

In his original article Rosenblium reported that 12 cases in his series were observed during the epidemic of recurrent fever which took place in his city in 1874 and again in 1875. However, in a footnote on the

1. Neymann, C. A.: Artificial Fever, Springfield, Ill., Charles C Thomas, Publisher, 1938, pp. 7 and 127.
2. Rosenblium, A. S.: Relation of Febrile Diseases to the Psychoses, Trudi vrach. Odessk. g. boln., 1876-1877, vol. 2, pt. B.
3. Zakon, S. J.: Alexander Samoilovich Rosenblium: His Contribution to Fever Therapy, Arch. Dermat. & Syph. **48**: 52 (July) 1943.
4. Oks, B.: Ueber die Wirkung fieberhafter Krankheiten auf Heilung von Psychosen, Arch. f. Psychiat. **10**: 249, 1879.
5. Leidesdorf, M.: Lehrbuch der psychischen Krankheiten, ed. 2, Erlangen, F. Enke, 1865, p. 142.
6. Wagner-Jauregg, J.: Verhütung und Behandlung der progressiven Paralyse durch Impfmalaria, Erg. Bd. d. Handb. d. experim. Therap., Munich, 1931.

fourth page of the German article the statement is made that "according to a personal communication of Rosenblium recurrent fever was produced in all these cases by inoculation of the patients with spirilla." Clinical experimentation of this sort was undoubtedly too advanced for the time; therefore he did not dare to describe the method but was forced to camouflage his experimentation under the guise of an "epidemic" of recurrent fever. It is apparent from reading the original article that he realized that it did not make much difference whether the fever was produced by an attack of typhoid, of malaria or of recurrent fever. His interest in the last named disease was probably due to the fact that it was easy to inoculate a patient with the spirilla of recurrent fever, because these organisms could be observed in a specimen of blood. Neymann believes that at least 10 of the cases represented an early stage of dementia paralytica and that possibly more were instances of syphilis of the central nervous system. It is impossible not to conclude with Neymann that Rosenblium was the first to appreciate the curative effect of fever itself on the psychoses and that he was the first to inoculate psychotic patients with the febrile disease. Possibly Wagner-Jauregg was not aware of the work of Dr. Rosenblium because of its publication in an obscure paper in a language little read outside the country of its origin.

THE INCIDENCE OF DIABETES IN SELECTEES

The analysis by Dr. Blotner and his associates [1] of the incidence of glycosuria among Massachusetts registrants for Selective Service is an extremely valuable study. While the figures in the article are impressive, they demand analysis and confirmation. The results of this study are puzzling, because the figures are much higher than those reported in the National Health Survey. Here is the incidence of diabetes in successive age groups in the Massachusetts material and in the age groups most closely corresponding in the National Health Survey of 1935-1936: [2]

Massachusetts Selectees		National Health Survey (Males)	
Age Group	Number of Diabetic per Thousand Registrants	Age Group	Number of Diabetic per Thousand
All ages	4.6	15-24	0.6
18-25	2.0	25-34	0.9
26-30	3.5	35-44	2.0
31-35	6.2		
36-40	6.1		
41-45	10.6		

If the Massachusetts data are at all representative, the incidence of diabetes among young adults is much greater than has hitherto been assumed on the basis of earlier studies—at least three to four times as great as actually observed in the National Health Survey at ages under 25 and four to five times at ages 25 to 45. In part, the differences shown may be explained on the basis that known cases escape enumeration in population surveys as well as symptomless cases that have not come to diagnosis. In addition, a steady sizable increase in the incidence of diabetes at younger ages has occurred since the last survey was made as a result of the lessened mortality among young persons with diabetes, while the incidence of new cases may be presumed to be stable. There are, however, several reasons why one should hesitate to assume that the Massachusetts figures are representative. The chief general considerations from the statistical point of view are these: 1. The number of cases of diabetes in the sample is not large: 208 altogether. 2. The experience is largely urban. Previous studies [3] have shown a significantly higher prevalence of diabetes in cities as compared with rural areas. Analysis of the Massachusetts data by density of population likewise indicates that the proportion with diabetes is appreciably lower in less thickly populated areas. 3. The ratios are particularly high also in men of racial stocks such as Jews and Irish, who form a much higher proportion of the Massachusetts population than that of the country as a whole. Among the men of native American stock there were about 3.5 with diabetes per thousand as compared with 4.6 in the experience as a whole. 4. It is significant that those known to be diabetic prior to examination numbered 42, or 1 per thousand. This ratio is practically identical with the figure for men between 20 and 45 in the National Health Survey. 5. The low proportion of overweights is surprising even though the weights are not previous maximum figures but as of the date of examination, and though obesity is less common among young diabetic patients than among those past 45.[4] Moreover, follow-up study [5] of a group of nondiabetic persons with glycosuria showed that even among the younger ones the proportion subsequently developing diabetes was much higher for overweight than for average weight or underweight patients. 6. The ratio of nondiabetic to diabetic persons with glycosuria is strikingly low—about 5 to 4. Unfortunately, no direct comparisons can be made with other material because the study under review excludes cases with a single positive specimen. 7. The Massachusetts figures for diabetes appear high in relation to the frequency of glycosuria among unselected men of the same age, as based on industrial, student, life insurance and periodic health examinations. It should be pointed out

1. Blotner, H.; Hyde, R. W., and Kingsley, L. V.: Studies in Diabetes Mellitus and Transient Glycosuria in Selectees and Volunteers, New England J. Med. **229**: 885, 1943.
2. Perrott, G. St. J.: Personal communication.
3. Joslin, E. P.; Dublin, L. I., and Marks, H. H.: Studies in Diabetes Mellitus: II. Its Incidence and the Factors Underlying its Variations, Am. J. M. Sc. **187**: 433, 1934.
4. Joslin, E. P.; Dublin, L. I., and Marks, H. H.: Studies in Diabetes Mellitus: IV. Etiology, Am. J. M. Sc. **191**: 759, **192**: 9, 1936.
5. Marble, A.; Joslin, E. P.; Dublin, L. I., and Marks, H. H.: Studies in Diabetes Mellitus: VII. Nondiabetic Glycosuria, Am. J. M. Sc. **197**: 533, 1939.

that only a fraction of the total among persons with glycosuria in these groups were diabetic. (*a*) Thus, among approximately 2,000 male employees of the Metropolitan Life Insurance Company under age 40 there were only 6 cases of glycosuria (0.2 per cent or over), or about 3 per thousand men. (*b*) A study of rejections for life insurance by the same company about ten years ago showed that 1.3 per thousand males at ages under 35 were refused Ordinary insurance because of glycosuria. (*c*) Dublin, Fisk and Kopf's [6] analysis of results of periodic health examinations showed the following proportions of white males with "marked" glycosuria: at ages under 25 (mostly 18 to 25), 1 per thousand; ages 25 to 34, 3 per thousand; ages 35 to 44, 3 per thousand. (*d*) Sydenstricker's [7] material of the same kind shows at ages 20 to 24, 1.1 per thousand; 25 to 29, 1.7 per thousand; 30 to 34, 2.2 per thousand; 35 to 39, 2.7 per thousand; 40 to 44, 5.2 per thousand. (*e*) Short and Ley's [8] material of a similar nature but based on quantitative tests showed the following:

Glycosuria, 0.6 per cent or more:	
Ages 20 to 29	1.9 per thousand
Ages 30 to 39	5.0 per thousand
Glycosuria, 1.1 per cent or more:	
Ages 20 to 29	1.4 per thousand
Ages 30 to 39	3.6 per thousand

(*f*) The Cincinnati [9] studies of white male office and industrial workers showed 9 per thousand with glycosuria (degree not specified). (*g*) Among 43,000 male college students there were only 33 with diabetes, or 0.7 per thousand.[10]

Apart from statistical considerations as to the general applicability of the Boston results, the incidence of diabetes in this study, largely based as it is on diagnoses from laboratory findings only, seems high on other grounds. The circumstances under which these men are examined are by no means ideal. The nervous tension attending the examinations undoubtedly gives rise to an increased number of transient glycosurias just as has been observed in college students during scholastic examinations [11] and in athletes immediately after a game.[12] Among the latter, hyperglycemia as well as glycosuria has been noted.[13] Again, many observers have called attention to the limitations of the dextrose tolerance test because it is an abnormal procedure and is influenced by a number of factors such as previous diet, infections and endocrine disorders.[14] It is notable that most of the cases among Massachusetts registrants were symptomless and even by laboratory standards comparatively mild. The low incidence of obesity has also been mentioned.

Probably a significant proportion of the 166 cases among the registrants who were not previously known to be diabetic would be found on later examination not to have true diabetes. It is, no doubt, desirable that these men be disqualified or at least postponed for military service, but the final diagnosis in many instances might be deferred.

The study by Blotner and his associates, however, gives good evidence that our estimates of the incidence of diabetes may have to be revised upward by an appreciable amount. It would be a distinct service both for clinical and for statistical purposes if all these men, except those previously known to have diabetes, or at least the large number of borderline cases, were followed up and reexamined at suitable intervals to determine whether their metabolic abnormality persisted. Intensive study of these cases might prove valuable in other directions also.

6. Dublin, L. I.; Fisk, E. L., and Kopf, E. W.: Physical Defects as Revealed by Periodic Health Examinations, Am. J. M. Sc. **170**: 576, 1925.

7. Sydenstricker, E., and Britten, R. H.: Physical Impairments of Adult Life: Prevalence at Different Ages, Based on Medical Examinations by the Life Extension Institute of 100,924 White Male Life Insurance Policyholders Since 1921, Am. J. Hyg. **11**: 95, 1930.

8. Short, J. J., and Ley, H. A., Jr.: Incidence of Albuminuria with Red Cells and Casts and of Glycosuria at Different Age Periods Among 10,060 Unselected Examinees, Proc. Life Extension Examiners **1**: 134, 1939.

9. Heart Council of Greater Cincinnati: Life Conservation Studies: I. Physical Impairment Among Office Workers, 1929; II. Physical Impairment Among Industrial Workers, 1930.

10. New York Diabetes Association: Incidence of Diabetes in Certain Educational and Industrial Groups, 1935.

11. Folin, O.; Denis, W., and Smillie, W. G.: Some Observations on "Emotional Glycosuria" in Man, J. Biol. Chem. **17**: 519, 1914.

12. Edwards, H. T.; Richards, T. K., and Dill, D. B.: Blood Sugar, Urine Sugar and Urine Protein in Exercise, Am. J. Physiol. **98**: 352, [Sept.] 1931.

13. Cannon, W. B.: Bodily Changes in Pain, Hunger, Fear and Rage, New York, D. Appleton & Co., 1929.

14. Joslin, E. P.; Root, H. F.; White, P., and Marble, A.: Treatment of Diabetes Mellitus, Philadelphia, Lea & Febiger, 1940, pp. 718 ff.

FROZEN-DRIED NERVE GRAFTS

Supplementing his earlier experiments on rats, Paul Weiss [1] of the Department of Zoology, University of Chicago, has developed a successful technic for the transplantation of stored frozen-dried nerve grafts into cats, monkeys and other larger animals,[2] a technic presumably applicable to man. In order to avoid sacrificing a "minor" nerve for the repair of a "more vital" one, earlier experimenters tested the feasibility of transplanting stored, preserved or fixed nerve tissues. Most of these attempts were unsuccessful, presumably because of autolysis or other forms of denaturation of stored nerve segments. Weiss tried the method of immediately freezing and dehydrating the excised nerve segments, a method of preservation and storage used with success in other fields of biochemical research.[3] Nerves dissected aseptically were dropped into isopentane immersed in liquid nitrogen (— 195 C.), where they were frozen instantaneously. The frozen nerve segments were then dehydrated for one week in high vacuum over phosphorus pentoxide at — 40 C., after

1. Weiss, P., and Taylor, A. C.: Proc. Soc. Exper. Biol. & Med. **52**: 326 (April) 1943.

2. Weiss, P.: Proc. Soc. Exper. Biol. & Med. **54**: 274, 277 (Dec.) 1943.

3. Hoerr, N. L.: Anat. Rec. **66**: 81, 91, 1936.

which they were stored for several months in sealed sterile containers. Before use the stored dried grafts were rehydrated in Ringer's solution in vacuo. As a result of rehydration the stored grafts resumed their normal appearance and major histologic characteristics, including specific staining reactions.[3]

Rehydrated frozen-dried grafts from 1 to 3 cm. in length have thus far been transplanted into hindleg nerves of 21 rabbits, 20 cats and 81 monkeys. The most successful technic was without the use of sutures, the grafts being held in place by elastic sleeves cut from rehydrated, frozen-dried arteries of the same species. The elastic sleeves were fitted over the nerve ends by means of a special splicing intrument designed by the author. After this instrumental fitting the sleeves were held in place by clotted blood. Casts or other means of restraining active or passive movements were not usually found necessary.

Six grafts in cats and 21 grafts in monkeys have thus far been examined functionally from five and a half to ten months after the operation. Motor recovery was tested by observation of spontaneous and reflex movements and by electrical stimulation of the exposed nerve. Among the 21 monkey grafts functional restoration was excellent in 8, good in 4, fair in 3 and poor in but 2 cases. Full recovery had occurred after the use of homoplastic grafts as well as macaque-to-spider grafts, in the latter case with perceptible delay. Cat-to-monkey grafts were unsuccessful. In a case in which full recovery occurred, tested 182 days after the operation, electric shock to the nerve trunk proximal to the graft gave strong contraction in intrinsic foot muscles at 320 mm. regeneration distance. Regeneration had thus proceeded at a minimum daily average of nearly 2 mm., including the graft and junction.

Microscopic studies of successful grafts have shown that the great mass of the regenerating fibers pass straight, unbranched, unobstructed across the gap into the distant stump and that there is neither fibrosis nor neuroma formation. The use of the arterial sleeve thus makes possible an orderly regeneration pattern, the majority of the fibers of a given fascicle remaining together and therefore reinnervating a relatively localized muscle group instead of being dispersed at random over the whole denervated periphery, as commonly happens after nerve suture.

Both nerve grafts and artery sleeves may be stored for at least four months in the frozen-dried condition without deterioration (longer storage has not yet been tested). Weiss therefore believes that banks of human nerves and artery sleeves of assorted sizes stored in the frozen-dried condition would be feasible in a modern hospital and valuable under present conditions caused by the war.

Current Comment

SIMILARITIES OF CERTAIN VIRUSES OF THE NERVOUS SYSTEM

The rickettsial, the smallpox, the influenzal and the poliomyelitic viruses represent different groups of closely related viruses to which can now be added the viruses of Russian spring-summer encephalitis and of louping ill. The encephalitis is a new clinical type observed by Russian investigators in thickly forested parts of Russia during May and June of recent years. The virus of this disease has been recovered from ticks (Ixodes persulcatus) and from wild rodents in certain regions. It has been passed experimentally by the tick from infected to healthy animals. It has been found[1] to be unrelated to other encephalitic viruses except that of the encephalomyelitis of sheep called louping ill. This virus can be transferred also from infected to healthy sheep by a tick (Ixodes ricinus). The comparative study of the viruses of the Russian encephalitis and of louping ill[1] show that they are closely related in complement fixation, neutralization and cross resistance tests as well as in the range and nature of their pathogenicity for animals. The Rockefeller Institute investigators regard the strains of the viruses they have studied as identical. The serum of a patient who became infected with either or both viruses while working with them responded in the same way to complement fixation and neutralization tests with the two. The serum of another patient who recovered from a laboratory infection with louping ill virus contracted in 1933 also gave similar positive results in tests with the two viruses. This establishment of definite groups or types of viruses will facilitate the study of the nature and scope of their pathogenic powers.

SEROLOGIC DIAGNOSIS OF RELAPSING FEVER

The diagnosis of relapsing fever may be difficult, since the symptoms resemble closely those of other diseases with intermittent fever. If pulmonary involvement is present the symptoms may be ascribed to other acute infectious diseases. From the blood of infected mice and rats Stein[1] has prepared a stable spirochetal antigen. Spirochete-containing blood was laked with saponin and the spirochetes were washed well with isotonic solution of sodium chloride. Suspensions of spirochetes obtained in this way were found to act as specific antigens in complement fixation and agglutination tests with serum from patients and animals infected with spirochetes of relapsing fever. Positive reactions were not obtained with serum of patients convalescent from other infections, e. g. typhus fever, malaria, Rocky Mountain spotted fever, Weil's disease, syphilis or typhoid. Stein's antigen merits further study, since it may prove to be useful in the diagnosis of relapsing fever.

1. Casals, J., and Webster, L. T.: Relationship of the Virus of Louping Ill in Sheep and the Virus of Russian Spring-Summer Encephalitis in Man, J. Exper. Med. **79**: 45 (Jan.) 1944.

1. Stein, G. J.: The Serologic Diagnosis of Relapsing Fever, J. Exp. Med. **79**: 115, Jan. 1944.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeons General of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

ARMY

THE NEWTON D. BAKER GENERAL HOSPITAL

The new Newton D. Baker General Hospital, near Martinsburg, W. Va., covers 30 acres on a military reservation consisting of 186 acres. Construction was begun during 1943, and the first patients were admitted in January 1944. Over 700 patients are now receiving treatment at the hospital, and it will eventually accommodate 1,750 patients. The hospital is built on the standard plan of the Army's general hospitals, with certain variations. A two story administration building connects by corridors with the rest of the installation. Corridors connect all buildings, so that it is not necessary to expose the patient at any time to climatic changes. There are approximately eighty buildings, including those not corridor connected. The walls are of masonry, and construction is of a semipermanent type. An automatic fire control system has also been installed. The space between the buildings is laid out in avenues and streets. A chapel has been erected and a guest house, under the management of the Red Cross, where relatives of patients may secure lodging for a few days while visiting. Air conditioned wards are provided for postoperative cases. Water is secured from three wells, and that used for washing and cooking is softened. A gymnasium is now in the process of construction, as well as a theater building. Portable moving picture units are moved through the wards for bed patients. When fully completed, all wards containing patients unable to move will be wired for sound, so that entertainment broadcast from the patients' auditorium, or from outside, can be received by all.

Col. E. L. Cook is the commanding officer of the new hospital, and the permanent personnel will consist of several hundred officers, nurses and enlisted men.

BRIG. GEN. CONDON C. McCORNACK RECEIVES LEGION OF MERIT AWARD

Brig. Gen. Condon C. McCornack, formerly of Eugene, Ore., has been awarded the Legion of Merit for "exceptionally meritorious conduct in the performance of outstanding service. As surgeon of the Western Defense Command and Fourth Army from Nov. 12, 1940 to Jan. 26, 1943 his exceptional qualities of leadership, high professional knowledge, keen foresight and sound judgment enabled him successfully to effect the organization and administration of the medical service of the command, thus assuring the availability of necessary medical supplies and the finest medical care for the troops, most of which were located in isolated combat positions on the west coast of the United States, immediately after the declaration of war Dec. 8, 1941. As Deputy Chief of Staff, Western Defense Command and Fourth Army, from Jan. 27 to Sept. 14, 1943, and Deputy Chief of Staff, Western Defense Command, from Sept. 15 to Dec. 23, 1943, Colonel McCornack exhibited sound military judgment, tact and resourcefulness in the coordination of headquarters, staff functions, and in the planning and handling of many details incident to the preparation of two major task forces which subsequently engaged and routed the enemy with complete success from one of his strongholds in the Aleutian Islands and forced his evacuation from the other." Dr. McCornack graduated from Jefferson Medical College, Philadelphia, in 1904 and has been in the service since 1910.

CAPT. REUBEN E. ALMQUIST AWARDED LEGION OF MERIT

Capt. Reuben E. Almquist, formerly of Albert City, Iowa, has been awarded the Legion of Merit "for exceptionally meritorious conduct in the performance of outstanding services" in the Solomon Islands. His deeds were described in a communication from the United States Army headquarters in the South Pacific: "Frequently the only officer present to direct the care of casualties, Captain Almquist commanded a medical battalion's collecting company when the Japanese bombed Rendova Island on July 2. His collecting station was the only organized medical installation and he calmly and skilfully treated the wounded while bombers roared overhead. On Laiana beach and Munda sector, New Georgia, snipers frequently directed their fire at his station, but he refused to permit that to interfere with the care of the wounded. On Arundel Island Captain Almquist organized and efficiently operated a 50 bed hospital under difficult conditions." Dr. Almquist graduated from Rush Medical College, Chicago, in 1928 and entered the service Aug. 15, 1942.

LIEUT. STUART C. KNOX RECEIVES ARMY SILVER STAR

Lieut. Stuart C. Knox, formerly of Los Angeles, serving in the Medical Corps of the U. S. Naval Reserve, who has been in the South Pacific war theater during the last year, received from the War Department a citation "for unusual gallantry in action for administering first aid and evacuating more than 100 wounded men under fire in New Georgia" and was awarded the Silver Star Medal of the Army. Dr. Knox was with the Marines invading the New Georgia group July 1 to Aug. 26, 1943 and has seen action in several other battles in the South Pacific. He graduated from the College of Medical Evangelists, Loma Linda, Calif., in 1934.

THIRTEENTH CLASS OF AVIATION PHYSIOLOGISTS

Graduation exercises at the School of Aviation Medicine, Randolph Field, Texas, for the thirteenth class of Aviation Physiologists were held March 18. Brig. Gen. Eugen G. Reinartz, U. S. Army, commandant of the school, presented the certificates. The course in aviation physiology is of five weeks' duration. Among those graduating were the following officers of the medical corps:

1st Lieut. Hylan Arthur Bickerman, Forest Hills, N. Y.
1st Lieut. Ralph J. Greenberg, Chicago.
1st Lieut. Harvey A. Lewis, Long Beach, Calif.

PROMOTIONS IN THE ARMY MEDICAL DEPARTMENT

The War Department recently announced the promotion of Brig. Gen. Paul R. Hawley, College Corner, Ohio, and Brig. Gen. George C. Dunham, Portland, Ore., to the temporary rank of major general. Col. Stanhope Bayne-Jones, New Haven, Conn., and Col. Condon C. McCornack, Eugene, Ore., were promoted to the temporary rank of brigadier general.

NAVY

LIEUT. COMDR. ROBERT W. SKINNER III AWARDED NAVY CROSS AND PURPLE HEART MEDAL

Lieut. Comdr. Robert W. Skinner III, formerly of North Wales, Pa., was recently awarded two medals—the Navy Cross and the Purple Heart. The citation accompanying the Navy Cross award read "For extraordinary heroism while attached to the First Marine Raider Battalion during action against the Japanese forces in the Solomon Islands from Aug. 7 to Oct. 10, 1942. In the fierce battle for possession of Tulagi, Lieutenant Commander Skinner distinguished himself by his expert professional skill and dauntless courage, often in positions exposed to heavy enemy fire, in administering aid to the wounded and supervising the evacuation of casualties, with the result that there were no cases of infection and practically all of the wounded recovered. Later, when his battalion was fighting on Lunga Ridge, he voluntarily made at least three trips from the forward to the rear dressing station, traversing several hundred yards of exposed terrain frequently swept by hostile fire. He subsequently accompanied our forces in the second and third Matanikau River battles, in the latter instance moving forward with the battalion, despite a badly injured knee. Lieutenant Commander Skinner's heroic conduct and valiant devotion to duty greatly contributed to the fighting efficiency of this battalion and were in keeping with the highest traditions of the United States Naval Service."

In the citation accompanying the Purple Heart award, it was related that Dr. Skinner was injured in the South Pacific area Sept. 27, 1942. He graduated from the University of Pennsylvania School of Medicine, Philadelphia, in 1938 and entered the service Dec. 16, 1940.

TWO OREGON NAVAL OFFICERS CITED

Lieut. (sg) William S. Gevurtz, formerly of The Dalles, Ore., has been cited by his commander for outstanding service while on the U. S. S. *Talbot*, when 178 survivors were rescued from another ship. The citation reads in part as follows: ". . . 38 were casualties requiring treatment. Many were of a serious nature, 19 having burns varying from less than 10 per cent to over 70 per cent of the body surface. Due to the professional skill, well planned preparations, essential organization and prior instruction of medical and first aid personnel, you were able to save all but 1 of the casualties received aboard. Further, the ship was under repeated air attack throughout the period of rescue, during which you and your medical detachment continued to function with no apparent concern for your own personal safety." Dr. Gevurtz graduated from the University of Oregon Medical School, Portland, in 1937 and entered the service in August 1941.

Lieut. Comdr. David E. Sullivan, formerly of Portland, Ore., was recently awarded the presidential unit citation for sinking more submarines than any other single unit in naval history. He has been flight surgeon on the U. S. S. *Card* for more than a year. Dr. Sullivan graduated from the University of Oregon Medical School, Portland, in 1940 and entered the service in September 1941.

NAVY'S NEWEST AND LARGEST HOSPITAL SHIP INSPECTED

A delegation from the Navy Department, headed by Vice Admiral Ross T. McIntire, Surgeon General of the United States Navy, were received aboard the Navy's newest, largest and most modern hospital ship, the U. S. S. *Refuge*, on March 5 in a combined official inspection and "open house" to invited guests. The new hospital ship was converted from the troop transport U. S. S. *Kenmore* and was placed in commission on February 24. The complement includes twenty medical officers, three dental officers, five hospital corps officers, one volunteer specialist officer who will be in charge of the optical repair unit, the first of its kind on a hospital ship, twenty-nine navy nurses, an American Red Cross representative, which is another "first" as far as hospital ships are concerned, fourteen chief pharmacist's mates and two hundred hospital corpsmen. The *Refuge* has fixed berths for 630 patients and carries aboard a mobile field hospital comprising 72 cots, a laboratory, x-ray equipment and necessary medical and surgical equipment and supplies. Each of the vessel's twelve wards has a surgical dressing room, diet pantry, utility room, linen locker, toilet and shower. The ship's main laboratory contains modern items of equipment such as a high speed centrifuge, a bacteriologic incubator, autoclaves, a refrigerator and other essentials. The library contains professional books and journals. The laundry is equipped with washing machines, spinners, tumblers, mangles and a steam press. Other features include a pharmacy, dental clinic, stationary and portable x-ray equipment, a complete physical therapy department and a clinic for eye, ear, nose and throat cases.

Comdr. M. A. Jurkops, New Brighton, N. Y., is commanding officer of the vessel and Capt. C. R. Wilcox is senior medical officer. Lieut. (jg) Mildred A. E. Marean is chief nurse.

NEW DEPOT HOSPITAL OFFERS FACILITIES IN EMERGENCY CASES TO THE NAVY V-12 UNIT

Col. John Huling Jr., commanding officer of the Navajo Ordnance Depot, offered the use of the facilities of the new depot hospital in emergency cases of the Navy V-12 Unit. The depot's new 54 bed hospital is completely staffed and was dedicated at a ceremony February 15. A letter of appreciation to the depot commander from the commandant of the Eleventh Naval District at San Diego, Calif., read as follows: "The Medical Officer, Navy V-12 Unit, Arizona State Teachers College, Flagstaff, has informed this office that your hospital, through you, has offered to accept any emergency, surgical and orthopedic cases from the unit. Your willingness to assist and cooperate with the Navy in such a friendly way is sincerely appreciated."

LIEUT. ARTHUR T. WILLETTS AWARDED SILVER STAR MEDAL

Lieut. Arthur T. Willetts, a Navy doctor accompanying the Marine invaders of Bougainville and formerly of Verona, Pa., has been awarded the Silver Star Medal for gallantry in attending wounded under fire. The citation accompanying the award set forth that "Lieut. Willetts on last November 1, finding the beach strewn with injured men, established an aid station under cover of jungle growth and stuck to his station despite six enemy machine gun attacks." Dr. Willetts graduated from the University of Pittsburgh School of Medicine in 1937 and entered the service March 9, 1942.

MODIFICATION OF MAXIMUM AGE LIMIT FOR APPOINTMENT AS ENSIGN

The Navy Department recently announced that the age limit contained in (*a*) Navy V-12 Bulletin No. 98 and NOPCL No. 11-43 and (*b*) Navy V-12 Bulletin No. 174 and NOPCL No. 12-43 has been modified in that qualified civilians who will have reached their 31st birthday by the time they may reasonably expect to graduate from medical or dental school are not eligible for appointment as Ensigns H-V(P) or induction and subsequent enlistment as Apprentice Seamen Class SV-12 or SV-12(S).

NAVY PERSONAL

Dr. Oswald S. Lowsley, New York City, recently returned from a tour of inspection of United States Naval Hospitals in his capacity as honorary consultant to the Medical Corps of the United States Navy. The tour included fourteen naval hospitals in the Middle West, on the Pacific Coast and on the Gulf of Mexico. In addition to making his inspection Dr. Lowsley addressed the medical officers of the various hospitals on "The Diagnosis and Treatment of Various Traumatic and War Injuries of the Organs of the Genital and Urinary Tracts."

MISCELLANEOUS

COMMITTEE ON THE MEDICAL RECORDS OF THE FEDERAL GOVERNMENT IN THE WAR

A study of the medical records created by agencies of the federal government during the last thirty years is being jointly conducted by the National Archives and the National Research Council with funds provided by the John and Mary R. Markle Foundation. This endeavor to determine the best method of dealing with the great mass of medical records, estimated at over 300,000 cubic feet in volume, that will have been accumulated before the end of the war was initiated by Dr. Solon J. Buck, archivist of the United States.

At present there are more than 900 hospitals and other units within the federal government that have records of the medical diagnosis, observation or treatment of individuals, digests and statistical summaries of such records, and records of medical research and experimentation. After a short time these records serve their initial purpose and are noncurrent so far as the unit that created them is concerned. There has, however, been no way of knowing how much of this material should be made available for research purposes through coordinated control and planning.

Under existing circumstances a physician doing research in a government hospital on one disease cannot possibly know what relevant material might be available at hundreds of other government hospitals. The Veterans Administration frequently must correspond with several hospitals to collect the medical records of one person. Scattered as they are, the records are simply inaccessible to any private investigator, no matter how zealous he may be.

On Dec. 6, 1943 the archivist called the attention of the Committee on Information, Division of Medical Sciences of the National Research Council, to the problems inherent in the government's accumulation of medical records. He declared that the general interest which the National Archives, the several federal agencies, the National Research Council and the medical profession have in the preservation and administration of the medical records of the federal government prompted him to lay before the committee a statement of the problem and to propose cooperative action by the Division of Medical Sciences and the National Archives with a view to its solution.

The archivist was of the opinion that the formulation of a comprehensive program for the medical records should be preceded by a thorough study of methods of creating and administering such records in the various agencies, the location, character, quantity and content of the various bodies of such records now in existence, and the nature and extent of the use that will or might be made of them. He proposed the designation of a committee within the Division of Medical Sciences of the National Research Council to supervise and conduct such a study and, on the basis of the facts collected, to make recommendations to him as to which of these medical records should be preserved and as to the best methods of administering the government's medical records so as to utilize their maximum scientific and administrative value.

The National Research Council authorized Dr. Lewis H. Weed, chairman of the Division of Medical Sciences, to appoint a committee. Those designated are Dr. George W. Corner, Baltimore, director of the Department of Embryology, Carnegie Institution of Washington, chairman; Dr. O. H. P. Pepper, University of Pennsylvania; Dr. Samuel C. Harvey, Yale University, and Dr. Harry Solomon, Harvard University. The following have been assigned by the various government services: Army, Surgeon General's Office, Col. A. G. Love; Adjutant General's Office, Col. R. M. Levy; Navy, Bureau of Medicine and Surgery, Capt. H. H. Montgomery; U. S. Public Health Service, Dr. S. D. Collins; Veterans Administration, Dr. Martin Cooley; Bureau of the Budget, Mr. Elbridge Sibley, and Mr. Dan Lacy, National Archives. Dr. R. K. Burns Jr., Department of Embryology, Carnegie Institution of Washington, is secretary. At its first meeting the committee restricted the study to include only medical records created in the last thirty years.

It was also decided to visit and survey a selected group of representative hospitals and other agencies of the government among the several departments and bureaus creating medical records. This will make it possible to study records of hospitals of all types and to collect information concerning the creation and flow of records from field units to the departmental level.

It is hoped that the information collected during the survey will enable the committee to determine the potential value of these medical records for research. Which of the records should be preserved to meet the research needs of the government and of private medical scholars? Will the interests of citizens and government be best served by leaving the records at scattered points or would it be more economical and increase the usefulness of the records to centralize them at some one place? Would centralization reveal latent values for technical medical research that have never been exploited? These and a host of other questions concerning the records are of vital interest to the medical profession in general.

If the committee's recommendations contain answers to the majority of these questions, it will contribute materially to the solution of the relatively new but already perennial question of what should be done about medical records; it will also help the archivist of the United States to round out postwar plans for an orderly retirement of the mass of records that may be left without an owner or sponsor when the war is over and the emergency agencies as well as the armed services are demobilized. It will have demonstrated a means whereby the archivist can avail himself of professional knowledge and experience not available to him on his own staff. But most important of all, the committee has the opportunity on behalf of the medical profession to guard against the dispersal of records which should be preserved in the interest of medical science.

EXHIBITION OF "OCCUPATIONAL THERAPY IN WAR AND PEACE"

The Philadelphia Art Alliance, with headquarters at 251 South 18th Street, will present from April 17 to May 30 the country's most representative exhibition of "Occupational Therapy in War and Peace." Every gallery and showcase in the Art Alliance will be taken over for the six weeks by this exhibit, which is under the direction of Miss Kathryn Wellman and a large committee. Regular demonstrations by actual occupational therapy patients will be given for the benefit of the public in the various rooms of the Art Alliance. One gallery will house a model occupational therapy shop as might be found in a civilian hospital, with finished and unfinished handicraft on view. Incapacitated patients will demonstrate in this shop every Saturday afternoon, and at that time Miss Wellman will be on hand to answer questions.

In another gallery of the Art Alliance, which will be set up as a functional shop, service patients from the Valley Forge General and the U. S. Naval Hospital will demonstrate the crafts which introduce exercise. These demonstrations will be held on Tuesday afternoons. The Art Alliance's regular Decorator's Gallery will be converted into a modern living room with furniture and furnishings constructed by occupational therapy patients in Army, Navy and civilian institutions. Other exhibitions will feature occupational therapy working materials, finished products, large photographs of patients at work and of their progress, and civilian made articles for sale. During the six weeks, all of the Art Alliance events will center about occupational therapy. These will take in Army and Navy technical discussions, talks on "Design in Salvage," "Muscle Therapy," "Creative Stitchery," "Group Occupational Therapy in Group Psychotherapy," "Occupational Therapy in the Pacific Area," "Rhythmic Exercises for Amputees" and three films from the British Information Service.

OFFICE OF CIVILIAN DEFENSE MEDICAL EQUIPMENT AND SUPPLIES

The Office of Civilian Defense recently issued a release dated February 15, supplementing notice dated July 1, 1943, on the Care and Maintenance of Mobile Medical Team and Casualty Station Equipment, in which it is stated that bonded state and local property officers are both accountable and responsible for federally owned medical supplies and equipment, and when a state or local chief of Emergency Medical Service accepts delivery of supplies and equipment from a property officer he becomes responsible therefor. Responsibility for the distributed supplies is transferred to the persons and institutions receiving them, provided the property officer is notified. A person having custody of federal property will not be held financially liable for its loss or damage unless such loss or damage occurs as a result of his negligence or abuse. Periodic inspections of all medical supplies and equipment should be made by mutual agreement.

The regional medical officer is held responsible for the supervision of U. S. P. H. S. plasma reserves, and property officers have no responsibilities in connection with plasma.

The U. S. Bureau of Narcotics is responsible for inspection of morphine reserves. Chiefs of Emergency Medical Service and property officers will recognize that agency's over-all responsibility for the control of narcotics.

RESPONSIBILITY OF REGIONAL MEDICAL OFFICERS

The regional medical officer will inquire concerning and, when possible, will inspect lent medical equipment, and he will advise the regional property officer concerning the technical care and maintenance of medical equipment. The regional medical officer will advise state chiefs of Emergency Medical Service and through them local chiefs concerning their duties with OCD medical property. The regional medical officer will report to the regional property officer any apparent neglect of federal equipment of which he may have knowledge. The regional medical officer will call to the attention of the state chief of Emergency Medical Service any evidence of ineffective local distribution. During emergency periods the regional medical officer with the approval of the regional director will direct interstate transfer of OCD medical equipment and supplies.

RESPONSIBILITIES OF STATE CHIEFS OF EMERGENCY MEDICAL SERVICE

The state chief of Emergency Medical Service is responsible to the State Defense Council and citizens of the state for taking appropriate steps to see that medical equipment is available and ready for use.

ARMY-NAVY E AWARDED TO ANSCO

Ansco, Binghamton, N. Y., America's oldest manufacturer of photographic materials, was recently awarded the Army-Navy E for "great accomplishments in the production of war equipment." Since Pearl Harbor approximately 75 per cent of Ansco's production has been for the government and essential war industries. Its camera plant is now exclusively engaged in the manufacture of precision instruments for the Army Air Forces and the Navy. Included in its wartime production are sextants which permit fliers to determine their position anywhere over the earth's surface under all weather conditions.

AMERICAN RED CROSS SHIPS GAUZE FOR 164 MILLION DRESSINGS

Surgical gauze for 104 million dressings has been requisitioned by the American Red Cross from U. S. Army medical supply depots and will be shipped to approximately two hundred larger Red Cross chapters throughout the country for processing. In addition, gauze for 60 million more surgical dressings has been ordered direct from manufacturers to be shipped to more than one thousand smaller chapters. Volunteers now are producing more than three million dressings daily to provide stocks wherever United States troops are in action. One billion dressings have been produced by the American Red Cross in the past two years.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, April 1, p. 993)

CALIFORNIA

St. Joseph's Hospital, San Francisco. Capacity, 289; admissions, 7,218. Sister M. Raymond, Superior (assistant residents—April 1, July 1).

St. Luke's Hospital, San Francisco. Capacity, 225; admissions, 6,678. Dr. Howard H. Johnson, Director (assistant residents—October 1).

ILLINOIS

St. Francis Hospital, Peoria. Capacity, 593; admissions, 14,093. Sister M. Ancilla, R.N., Superintendent (interns—October 1).

MISSOURI

Alexian Brothers Hospital, St. Louis. Capacity, 176; admissions, 1,976. Brother Athanasius, R.N., Superintendent (resident—April, October 1).

NEW YORK

Cumberland Hospital, Brooklyn. Capacity, 400; admissions, 6,205. Dr. Max Seide, Superintendent (3 interns—October 1).

OHIO

Aultman Hospital, Canton. Capacity, 180; admissions, 6,332. Mr. James W. Stephan, Director (interns, residents).

WASHINGTON

Eastern State Hospital, Medical Lake. Capacity, 2,200; admissions, 644. Dr. M. W. Conway, Superintendent (resident—psychiatry—October 1).

COMMUNITIES IN NEED OF PHYSICIANS

The United States Public Health Service has recently announced that the following four communities have applied for federal assistance in obtaining the services of physicians under the recently enacted law authorizing an appropriation of $200,000 for the relocation of physicians:

Hamilton (Harris County), Georgia.
Neosho (Newton County), Missouri.
Pineville (Mecklenburg County), North Carolina.
Star (Montgomery County), North Carolina.

Physicians interested in locating in these communities should communicate with the Surgeon General, United States Public Health Service, Washington (Bethesda Station), D. C.

WARTIME GRADUATE MEDICAL MEETINGS

Additional subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

At Indiana University School of Medicine, Indianapolis: Management and Prognosis in Head Injuries, Dr. R. L. Glass, April 10; Investigation of Sterility, Dr. C. P. Huber, April 10.

Dr. Barnard Horton, Rochester, Minn., will speak on his recent studies on multiple sclerosis April 17 in Columbus, Ohio, for the combined medical personnel at Fort Hayes and the Lockbourne Air Base. On April 18 he will present the same subject before the medical personnel at Patterson Field and at Wright Field and the Dayton Academy of Medicine.

INCREASING PENICILLIN PRODUCTION

The War Production Board recently announced that representatives of twenty-one producers have authorized a committee from their industry to explore, with the War Production Board, various forms of agreement for the exchange of technical information and patents in endeavoring to increase penicillin production. The committee is to study possible contract forms and recommend an agreement between producers and WPB, which, it is hoped, may be concluded soon. In granting authority for the explorations of the committee, producers' representatives expressed themselves as desirous of doing everything possible to increase the production of penicillin within the shortest period of time. The committee members are A. H. Friske, Eli Lilly and Company, Indianapolis; H. C. Fritsch, Parke, Davis and Company, Detroit; Carleton H. Palmer, E. R. Squibb & Sons, New York; Dr. John Reichel, Reichel Laboratories, Inc., Kimberton, Pa., and Kenneth H. Hoover, Commercial Solvents Corporation, Terre Haute, Ind.

ORGANIZATION SECTION

OFFICIAL NOTES

COUNCIL ON MEDICAL SERVICE AND PUBLIC RELATIONS

Washington Information Office Established

The resolution of the Council relative to the opening of an Office of Information in Washington, passed at the February meeting and submitted to the Board of Trustees for approval, has received the unanimous sanction of that body.

The office will be under the direction of the Council and Secretary and in direct charge, for the time being, of Dr. Joseph S. Lawrence of Albany, N. Y., who has represented the New York State Medical Society in Albany for over twenty years. A large number of booklets, pamphlets and other published material are being sent to Washington, where they will be readily available to those desiring information concerning the various fields of medicine and the activities of the American Medical Association. The Council will continue its Chicago office as usual, and its semimonthly bulletin will be prepared in that office.

The location of the office in Washington is in suite 900 of the Columbia Medical Building, 1835 I Street Northwest. The date of opening was April 3.

DOCTORS AT WAR

Radio broadcasts of Doctors at War by the American Medical Association in cooperation with the National Broadcasting Company and the Medical Department of the United States Army and the United States Navy are on the air each Saturday at 4:30 p. m. Eastern war time (3:30 Central war time, 2:30 Mountain war time and 1:30 Pacific war time).

The titles and guest speakers for the next three programs are as follows:

April 8. "Men with New Faces."
Speaker, Major General D. N. W. Grant, M. C., A. U. S., Air Surgeon A. A. F., Washington, D. C.
April 15. "Decks Aflame."
Speaker, Capt. French Moore (MC), U. S. N., Washington, D. C.
April 22. "Cadet Nurse Recruiting."
From Washington, D. C.

WOMAN'S AUXILIARY

Arkansas

The Allen County auxiliary honored Mrs. L. J. Kominsky, state president, at a luncheon. Mrs. Kominsky discussed the two new national committees, the Doctors' Aid Corps and the War Work Committee. Mrs. William Hibbitts, member of the national board, discussed the Wagner bill.

Colorado

The board of management of the Woman's Auxiliary to the Colorado State Medical Society held its midyear business meeting at the home of the president, Mrs. Lawrence T. Brown, Denver.

The Denver County auxiliary met in January at the Nurses' Home of the Denver General Hospital. Books were contributed to the Nurses' Library.

The Medical Auxiliary of Northeastern Colorado met on January 13. After a business session a review of Josephine Lawrence's book "There is Always Today" was presented.

Florida

At a recent meeting of the Polk County auxiliary the wives of doctors at the Bartow Air Base and Drane Field, and the auxiliary members whose husbands are in service, were honored at a social in Lakeland.

Indiana

The annual guest dinner of the Vigo County auxiliary was held recently. A play was read by Mrs. Grace Moorehead.

Kansas

The Saline County auxiliary recently gave a luncheon in honor of the state president, Mrs. E. E. Tippin of Wichita. Mrs. Oliver Ebel spoke on "Medical Headlines and Oddities."

Rice County auxiliary entertained the Medical Society with a buffet supper recently in Sterling.

Shawnee County auxiliary entertained in January with a dessert luncheon in Topeka. Dr. H. L. Herbert of the Kansas Board of Health discussed "Modern Attacks of Tuberculosis."

The Wyandotte County auxiliary met in January. Dr. W. H. Pickett of the department of health spoke on "Medicine Up to Date." In February the Wyandotte Auxiliary held its annual Public Relations Test at Bethany Hospital Nurses' Home in Kansas City. Mr. Oliver Ebel, executive secretary of the Sedgwick County Medical Society, was the guest speaker.

The Marshall County auxiliary had election of officers at the February meeting.

Minnesota

The midyear board meeting of the Minnesota auxiliary was held in February. Mrs. F. S. McKinney, state president, organized a new auxiliary, that to the Waseca Medical Society. Mrs. S. C. Oeljen was elected president and Mrs. B. J. Gallegar secretary-treasurer.

Mississippi

Mrs. Temple Ainsworth was made general chairman of arrangements for the state convention of the Central Auxiliary of Mississippi, which will meet in Jackson. Mrs. A. L. Gray is president of the auxiliary. Mrs. R. L. Simmons was elected president of the East Mississippi auxiliary, and Mrs. J. Rice Williams of Huston was elected president of the Northeast Mississippi auxiliary.

South Carolina

The Woman's Auxiliary to Oconee County Medical Society and the Pickens County auxiliary held meetings recently. At both meetings Mrs. D. L. Halford, tuberculosis worker for Oconee and Pickens counties, spoke on tuberculosis work in South Carolina.

MEDICAL LEGISLATION

STATE MEDICAL LEGISLATION

New Jersey

Bill Introduced.—S. 199 proposes to authorize the state department of health, and the local boards of health within their respective jurisdictions, to require any person suspected of being infected with a communicable disease to submit to a medical or roentgenologic or laboratory examination and to permit such specimens of blood and bodily discharges, secretions or excretions to be taken as may be necessary to establish the presence or absence of the disease.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Dr. Roy Kracke Named Dean at Alabama.—Dr. Roy R. Kracke, professor of pathology and bacteriology and chairman of the department at Emory University School of Medicine, Atlanta, Ga., has been named dean of the new Medical College of Alabama to be organized in Birmingham (THE JOURNAL, March 4, p. 658). Dr. Stuart Graves, who has been dean of the two year school at the University of Alabama School of Medicine, University, during the transition period of the development of the two year school into a four year college, will remain as dean of the school of basic medical sciences. He will also continue as an adviser on student health, acceptance of medical students and development of the new medical college. Dr. Kracke was born in Hartselle, Dec. 5, 1897. He attended Alabama Polytechnic Institute, Auburn, and in 1924 received his bachelor's degree from the University of Alabama. He received his degree in medicine at the Rush Medical College in 1928. He spent a year in 1925 at the University of Alabama, University, as instructor in pathology. He later was appointed to Emory University as instructor in pathology, subsequently serving as assistant professor, associate professor and professor of pathology, bacteriology and laboratory medicine. In 1934 he was awarded the certificate of merit by the American Medical Association for his exhibit showing original investigation for his work illustrating the knowledge of etiology of granulocytopenia and in 1935 the gold medal of the American Society of Clinical Pathologists for his work on agranulocytic angina. He has written extensively and is author of "Diseases of the Blood and Atlas of Hematology" (with Hortense Garver). Dr. Graves, who graduated at Syracuse University College of Medicine, New York, in 1911, has been serving as dean and professor of pathology at Alabama since 1928. He was also acting state health officer for Alabama from 1929 to 1930. Prior to joining the faculty of Alabama he had been professor of pathology and bacteriology at the University of Louisville School of Medicine from 1914 to 1928, serving as dean of the medical school from 1922 to 1928. As the plans progressed for the development of the new four year school, Dr. Graves urged the university administration to secure a younger man for the project because of the fact that he was approaching the retirement age.

ARIZONA

State Medical Meeting.—The Arizona State Medical Association will hold its annual meeting at the Hotel Westward Ho in Phoenix, April 14-15, under the presidency of Dr. Otto E. Utsinger, Ray. Members of the faculty of the University of Southern California School of Medicine, Los Angeles, will present the program. On Friday evening a session will be devoted to a discussion of Coccidioides by Drs. Edward M. Butt and Arthur M. Hoffman. Saturday the program will be conducted by Drs. Frederick J. Moore, Philip I. Cunnane and Gurth Carpenter.

CALIFORNIA

Joint Session on Tuberculosis.—The California Tuberculosis Association and the California Trudeau Society met at the Biltmore Hotel, Los Angeles, March 28-30. Among the guest speakers were Drs. John Alexander, professor of surgery, University of Michigan Medical School, Ann Arbor, and Henry S. Willis, pathologist and superintendent of William H. Maybury Sanatorium, Northville, Mich. Among the topics to be discussed by the guests were "Practical Considerations Regarding Thoracoplasty" and "Perspective and Trends in Tuberculosis."

Court Issues Writ Restraining State Board in Abortion Case.—The San Francisco Superior Court has ruled that the state board of medical examiners acted illegally when it moved to revoke the license of Dr. Chester D. Sewall, Redding, on a charge of performing two illegal operations, newspapers reported recently. Judge Theresa Meikel issued the ruling on a mandamus action filed on behalf of Dr. Sewall shortly after the medical board on July 1, 1942 declared him guilty on two counts. Judge Meikel held that a permanent writ would be issued restraining the medical board from proceeding further with the case. A preliminary writ was issued in November 1942.

DELAWARE

Society News.—A symposium on peptic ulcer was presented before the New Castle County Medical Society, Wilmington, March 21 by Drs. Lawrence J. Rigney and John C. Pierson, Wilmington. Major Maurice A. Schnitker, M. C., A. U. S., also addressed the society on "Significance of Ulcer in Armed Forces."

FLORIDA

State Medical Meeting in St. Petersburg.—The seventy-first annual meeting of the Florida Medical Association will be held at St. Petersburg, April 13-14, with headquarters at the Princess Martha Hotel and under the presidency of Dr. Eugene G. Peek, Ocala. Dr. Edgar G. Ballenger, president-elect of the Southern Medical Association, Atlanta, Ga., will address the first general session, Thursday, on "The Relationship of Obstructive Lesions to Urologic Affections." Included among the other speakers will be:

Capt. Theodore L. L. Soniat, M. C., A. U. S., Psychiatric Experiences in an Army Air Base Hospital.
Capt. Millard B. White, M. C., A. U. S., Penicillin.
Capt. Morris B. Guthrie, M. C., A. U. S., Primary Atypical Pneumonia: Analysis of 150 Cases.
Dr. Duncan T. McEwan, Orlando, Refrigeration Anesthesia of the Extremities: Its Application, Use and Case Reports.
Lieut. Comdr. Carroll J. Fairo (MC), U. S. Naval Reserve, Gynecologic Problems Beginning at Forty.
Dr. Henry C. Sweany, Chicago, The Challenge of Tuberculosis to the Physician.
Dr. Walter I. Lillie, Philadelphia, Fundus Changes in Arterial Hypertension.

Specialty groups meeting during the session will include the Florida section of the American College of Physicians, the Florida Society of Ophthalmology and Otolaryngology, the Florida Association of Industrial Surgeons, the Florida Society of Dermatology and Syphilology, the Florida Radiological Society and the Florida Pathological Society. The eighteenth annual meeting of the woman's auxiliary to the state medical society will be held at the Army and Navy Club, April 14.

ILLINOIS

Citizens' Public Health Committee.—A citizens' public health committee was organized in St. Clair County February 22. The new group is educational in nature and will attempt to familiarize citizens with the legislation affecting health units.

Chicago

The Lewis Linn McArthur Lecture.—Dr. Thomas Grier Miller, professor of clinical medicine, University of Pennsylvania School of Medicine, Philadelphia, will present the twentieth Lewis Linn McArthur Lecture of the Frank Billings Foundation, Institute of Medicine of Chicago, at the Palmer House, May 26. His paper will be entitled "Observations on the Human Digestive Tract by Intubation."

Survey Nearing Completion for Medical Center.—The medical center commission named by the state legislature in 1941 to develop a medical center in the area bounded by Congress Street, Roosevelt Road, Ashland and Oakley avenues, is completing a survey of more than 2,200 parcels of privately owned property. A meeting was held March 16 by the commission to discuss plans for expanding the medical center near the Cook County Hospital.

Maternity Center Has New Library.—The Chicago Maternity Center recently dedicated its library, made available by the financial gift of the family of Mrs. Lena K. Witkowsky, for whom the library has been named. The library will be for use of the staff, medical students and nurses. This is the first time in the years since the center was established in 1897 that it has had its own library; the only collection heretofore available was one given by the late Dr. Joseph B. De Lee.

The Capps Prize.—On recommendation of the committee on the Joseph A. Capps Prize, the board of governors of the Institute of Medicine of Chicago announces that no award was made for 1943. Manuscripts for the current competition must be submitted to the secretary of the institute, 86 East Randolph Street, not later than December 31. Competition is open to graduates of Chicago medical schools who completed their internship or one year of laboratory work in 1942 or thereafter. The prize consists of $400 for the most meritorious investigation in the specialties of medicine. The investigation may be also in the fundamental sciences, provided the work has a definite bearing on some medical problem.

Lectures on Popular Science.—A series of lectures on popular science and technology is being given at the Museum of Science and Industry, Jackson Park, April 7-May 26. Dr. Milan V. Novak, professor and acting head of the department of bacteriology and public health, University of Illinois College of Medicine, gave the first lecture, on penicillin. Others in the series will include one April 28 by Dr. Ralph W. Gerard, professor of physiology, University of Chicago School of Medicine, on "Biological Aspects of War and Peace" and one May 5 by Dr. Andrew C. Ivy, Nathan Smith Davis professor of physiology and head of the department, Northwestern University Medical School, on "Aviation Calls the Doctor."

Arquin Fund for Clinical Research.—The board of governors of the Institute of Medicine of Chicago has accepted the custody of a memorial fund collected by friends and associates of Dr. Sergius F. Arquin, who died Dec. 8, 1928 as a result of epidemic cerebrospinal meningitis while an intern at Cook County Hospital. The income from the fund is to be used as a prize for investigative work or as a contribution toward the cost of publication or illustration of such work, or for related assistance in clinical research carried on by an intern or resident in Cook County Hospital or other local hospitals. Applications should be addressed to the secretary of the Institute of Medicine of Chicago, 86 East Randolph Street, Chicago 1.

INDIANA

Personal.—Col. Frederick C. Potter, head of the pathology department at Billings General Hospital and for many years associate professor of nervous and mental diseases, Indiana University School of Medicine, Indianapolis, has been granted honorary membership in the Indianapolis Medical Society.——Dr. Robert E. Lyons Jr., formerly a major in the army, who recently received a medical discharge, has reopened his office in Bloomington, where he will resume his private practice.

Physician Honored.—Dr. Bonnelle W. Rhamy, Fort Wayne, was guest of honor at a dinner at the Fort Wayne Country Club, February 10, celebrating his seventieth birthday, February 11. Dr. Rhamy in 1905 opened the Fort Wayne Medical Laboratory, which he has conducted ever since. A congratulatory scroll was presented to the physician, whose work has included the invention of a method of preservation of complement by the addition of sodium acetate, a triple stain for use in staining frozen sections and a method for the cultivation of Pasteurella tularensis.

KENTUCKY

Library Named for Physician.—The library in the new $80,000 Campbell County Health Center, Covington, has been named in honor of Dr. Claude Youtsey, Newport, who died March 5, 1943. At the dedication exercises a life size picture of Dr. Youtsey and a memorial plaque were presented to the center. Dr. Youtsey, as chairman of the county health board for many years, was instrumental in obtaining federal and state aid which made the building of the health center possible, the Covington *Post* reported March 6.

MAINE

Campaign Against Tuberculosis and Cancer.—The Maine Public Health Association this month is carrying on its annual early diagnosis campaign for the prevention of tuberculosis, and the Maine Division of the Women's Field Army is directing its annual drive for funds for cancer control. The theme for the tuberculosis program for this year, sponsored by the National Tuberculosis Association, is the promotion of chest x-ray examinations for war essential workers.

MICHIGAN

Protein Research.—A new series of studies on protein metabolism will be inaugurated soon at the Wayne University College of Medicine, Detroit, to be carried on under the supervision of Dr. John W. Hirshfeld, assistant professor of surgery, and Arthur H. Smith, Ph.D., professor of physiologic chemistry. The project will be financed by the United States government through the Office of Scientific Research and Development.

Laboratory Services Extended to Include Identification of Paratyphoid.—The laboratories of the state health department in Lansing are now aiding physicians in the state in identifying some of the rarer types of paratyphoid fever. The laboratories are the sixth in the United States to give this service, according to *Michigan Public Health*. Heretofore cultures have been sent by the department to laboratories of the University of Kentucky, Lexington, first in the United States to undertake these studies, it is stated.

Personal.—Dr. Samuel G. Albert, who recently received an honorable discharge from the U. S. Army, has begun the practice of medicine in Ironwood.——Dr. Charles L. Hess, Bay City, has been appointed to succeed Dr. Roy C. Perkins, Bay City, on the state advisory council of health.——Dr. and Mrs. Sherman L. Loupee, Dowagiac, observed their fiftieth wedding anniversary March 5.——Dr. Emily L. Ripka-Hautau, Roscommon, has been chosen health officer of Midland County to succeed Dr. Ralph R. Sachs, who has moved to Richmond, Wash.

Graduate Courses.—On March 9 the annual postgraduate program for graduates in medicine opened under the auspices of the Michigan State Medical Society in cooperation with the University of Michigan Medical School, Ann Arbor, Wayne University College of Medicine, Detroit, the state department of health and the Wayne County Medical Society, Detroit. The various courses will be conducted intermittently until May 26, covering a wide range of subjects. Additional information may be obtained from the committee on postgraduate education, Michigan State Medical Society, Room 2040, University Hospital, Ann Arbor.

MISSISSIPPI

Personal.—Dr. Joseph Howard Beard Jr., Urbana, Ill., has been lent by the U. S. Public Health Service to become health officer of Wilkinson County to succeed Dr. Robert M. Wingard. The latter has been assigned to Mobile, Ala., on a public housing project.——Dr. Samuel E. Eason, New Albany, was recently elected president of the Mississippi State Board of Health, succeeding Dr. James W. Lipscomb, Columbus.

Southwest Allergy Forum.—An informal round table conference will be conducted by the Southwest Allergy Forum in Jackson, April 15-16. Among the leaders in the conference will be:

Dr. Edley H. Jones, Vicksburg, Vasomotor Rhinitis.
Dr. Joseph S. Shavin, Shreveport, La., Angioneurotic Edema and Urticaria.
Dr. Bernard G. Efron, New Orleans, Evaluation of Systemic Reaction.
William T. Penfound, Ph.D., New Orleans, Pollination of Anemophilous Trees in New Orleans.
Dr. Ralph Bowen, Houston, Texas, Seasonal Hay Fever Due to Tree Pollens.
Dr. Homer E. Prince, Houston, Differential Diagnosis of Bronchial Asthma in Infants and Young Children.
Dr. Herbert J. Rinkel, Kansas City, Mo., Diagnostic Regimen in Food Allergy.
Dr. Fannie L. B. Leney, Oklahoma City, Practical Consideration of Contact Dermatitis as Seen by the Allergist.
Dr. Orval R. Withers, Kansas City, Headache as an Allergic Problem.
Major Lawrence J. Halpin, M. R. C., Treatment of Poison Ivy Dermatitis.

NEW YORK

Fund for Research in Clinical and Preventive Medicine.—An anonymous contribution has been given to Cornell University to endow a scholarship to be known as the Veranus A. Moore Research Fund in honor of the former dean of the state veterinary college in Ithaca. The income from the fund will be used for research in clinical and preventive medicine. Dr. Moore died in 1931.

Graduate Lectures.—The Cortland County Medical Society will be addressed April 21 by Dr. Harold J. Stewart, New York, on "Use of the Electrocardiogram in Heart Disease" and May 19 by Dr. Stearns S. Bullen, Rochester, on "Asthma." Dr. Stockton Kimball, Buffalo, will discuss "Malaria and the Dysenteries" before the Steuben County Medical Society, Corning, April 13. The lectures are part of a cooperative program of the state medical society and the state department of health.

New York City

The Harvey Lecture.—Earl A. Evans Jr., Ph.D., professor of biochemistry, University of Chicago, will deliver the seventh Harvey Society Lecture of the current series at the New York Academy of Medicine, April 20. He will discuss "Carbon Dioxide Fixation in Animal Tissues."

William Henry Welch Lectures.—Dr. Frank C. Mann, Rochester, Minn., delivered the William Henry Welch lectures at Mount Sinai Hospital, April 3-4. His subjects were "Studies on the Dehepatized Animal: A Review" and "Restoration and Pathologic Reactions of the Liver."

Birthday Celebration in Honor of Dr. Castiglioni.—The seventieth birthday of Dr. Arturo Castiglioni, professor of the history of medicine, Yale University School of Medicine, New Haven, and president of the New York Society for Medical History, will be observed at a dinner in the Starlight Roof, Waldorf-Astoria Hotel, April 12. An anniversary

volume will be presented to Dr. Castiglioni as a memento of the occasion. Dr. Castiglioni was born in Trieste, Italy, April 10, 1874. He received his medical degree at the University of Vienna in 1896.

Conference on Convalescence and Rehabilitation.—The second national conference on convalescence and rehabilitation will be held at the New York Academy of Medicine, April 25-26, under the auspices of the committee on public health relations of the academy and the support of the Josiah Macy Jr. Foundation. Representatives of all military services will be included in the program, which will deal with such topics as motivation, retraining, research and the role of home, hospital and industry. Admission will be by invitation. Edward H. L. Corwin, Ph.D., is executive secretary of the academy.

City Hospital and New York Medical College Establish Teaching Affiliation.—A teaching affiliation has been established between the City Hospital of the department of hospitals and the New York Medical College. According to an announcement by Dr. Edward M. Bernecker, city commissioner of hospitals, and Dr. J. A. Werner Hetrick, dean of the New York Medical College, extensive clinical facilities in medicine, surgery, obstetrics, gynecology, neurology and pathology will now be available to students of the medical college. The hospital is located on Welfare Island adjacent to the Metropolitan Hospital, which is also used for teaching purposes by the college. The city hospital was founded in 1832. It now has accommodations for 880 beds, averaging 10,000 admissions a year with an average stay of twenty-three days. About 30 per cent of the patients have chronic diseases. The hospital maintains jointly with the Metropolitan Hospital an outpatient department at 80th Street and East End Avenue. Coincident with the start of the new arrangement is the appointment of a number of physicians to the clinical faculty of the medical college.

Program to Develop Postwar Services at Mount Sinai Hospital.—With the appointment of Dr. George Baehr as director of clinical research and of Dr. Isidore Snapper as director of graduate medical education, a far-reaching program of expansion and reorganization has been launched at Mount Sinai Hospital to prepare for postwar responsibilities. The two positions are newly created ones. While the new appointments are the first steps in the program of expansion, later developments will include enlargement of the hospital's clinical and laboratory facilities and the creation of a number of full time paid fellowships for promising young physicians and research workers. Mount Sinai began its work as a teaching institution in 1872, when the first interns were appointed to its house staff. In 1910 the hospital began undergraduate medical instruction, opening its facilities to students of the Columbia University College of Physicians and Surgeons. In 1923 this affiliation was expanded to postgraduate teaching and placed on a formal basis. The faculty of the hospital's department of graduate medical instruction, which Dr. Snapper will head, consists of about 120 members of the Mount Sinai staff, many of whom are also members of the Columbia faculty. Dr. Baehr, under the new title of director of clinical research, will coordinate all the clinical research activities at the hospital, to gear them to the work of the laboratories and to bring about the most productive use of the institution's facilities. Dr. Baehr, until recently chief medical officer, U. S. Office of Civilian Defense, and formerly president of the hospital's medical board, has, in addition to the new position, returned to Mount Sinai as attending physician to the First Medical Service. Dr. Snapper, who formerly served on the faculties of the University of Amsterdam and the University of Peiping, has been appointed attending physician to the hospital's Second Medical Service. He was for nineteen years professor of propadeutic medicine and general pathology at the University of Amsterdam. He later served as professor of medicine at the Peiping Union Medical College. After his arrest by the Japanese Army on Dec. 7, 1941 Dr. Snapper was later, in 1942, exchanged for five Japanese internees. In 1943 he went to the Netherlands West Indies on a special mission for the Netherlands government and later became consultant to the United States War Department, assigned to the office of the Surgeon General of the Army in Washington, D. C. He was also medical adviser to the commissioners of the Netherlands Indies, Surinam and Curaçao.

Bellevue Hospital Rapid Treatment Center Dedicated.—The dedication of the Bellevue Hospital rapid treatment center for controlling the spread of venereal diseases by the most advanced methods of therapy in syphilis and gonorrhea took place on April 1 with Mayor Fiorello H. LaGuardia giving the principal address. The center has been made possible through the cooperation of the Federal Works Agency and the U. S. Public Health Service. Lanham Act funds totaling $575,000 were allocated for the project. Federal maintenance will continue for the duration, but after the war the city department of hospitals will have the benefit of the construction and equipment, with the city providing funds for staff and maintenance. For syphilis the treatment will be in general arsenotherapy combined with fever. When and if penicillin is available, it will be used. For gonorrhea patients sulfonamide drugs will be used. Fever therapy will be used for those patients who do not respond to the sulfonamide drugs. The U. S. Public Health Service has assigned Cornelius T. Stepita, surgeon, U. S. P. H. S., as administrator of the treatment center under the direction of the medical superintendent of Bellevue Hospital, Dr. William F. Jacobs. The U. S. Public Health Service has also assigned a charge nurse and a record analyst. The maintenance and operation budget supplied through the Federal Works Agency provides for some 150 employees, including nurses, dietitians, medical social workers, educational and recreational staff, laboratory workers, hospital helpers, clerical staff and maintenance workers. Dr. Evan W. Thomas, chief syphilologist at Bellevue Hospital, and Dr. Alfred Cohn, in charge of gonococcus research for the department of health, will direct the treatment of patients, and all necessary medical, surgical and specialty consultations will be by the Bellevue Hospital visiting staff. There will be both an inpatient and an outpatient service at Bellevue which will have a 200 bed capacity. The building being utilized for the treatment center is the south wing of the six story pathology building, formerly used as a male dormitory for Bellevue Hospital employees. Reconstruction and remodeling work under the direction of the department of public works began last December. A rehabilitation program, to be conducted in buildings of the former Convalescent Day Camp on Welfare Island, is part of the rapid treatment center project. This will also be on twenty-four hour service with a 100 bed capacity and operated in conjunction with the board of education. The program will include vocational courses especially aimed at employment in war industries and recreational facilities for patients. After-care supervision will be the responsibility of medical social workers. Psychiatric service where necessary will be provided by Bellevue Hospital.

NORTH CAROLINA

Personal.—Fred W. Ellis, Ph.D., formerly associate in pharmacology at Jefferson Medical College of Philadelphia, has been appointed assistant professor of pharmacology in the University of North Carolina School of Medicine, Chapel Hill. ——Dr. Frederick D. Austin Jr., Charlotte, coroner of Mecklenburg County, has entered military service.

Tri-State Meeting.—Dr. George H. Bunch, Columbia, S. C., was chosen president elect of the Tri-State Medical Association composed of North and South Carolina, Virginia, at its meeting in Charlotte, February 29, and Dr. Karl B. Pace, Greenville, was installed as president. Dr. Pace succeeds Dr. Frank S. Johns, Richmond, Va. Other officers include Dr. Oscar B. Darden, Richmond, and Richard B. Davis, Greensboro, vice presidents, and Dr. James M. Northington, Charlotte, secretary-treasurer. The association voted to hold its 1945 convention in Columbia.

OHIO

Selman Lecture.—Col. Richard P. Strong, director of tropical medicine, Army Medical School, Washington, D. C., delivered the Julius J. Selman Lecture at Mount Sinai Hospital, Cleveland, March 13, on "Tropical Diseases in Relation to the Present War."

Graduate Course.—The eighth annual graduate course in otology, rhinology and laryngology, University of Cincinnati College of Medicine, will be held May 15-20. This course is to be given by the department of otology and anatomy and is a refresher course for practicing otolaryngologists either in or out of the armed forces.

OREGON

Memorial Fund for Physician Who Died at Guadalcanal.—A memorial fund of $600, contributed by friends of the late Lieut. Comdr. Joseph Lipschutz (MC), U. S. Naval Reserve, has been given to the University of Oregon Medical School, Portland, by his wife, Mrs. Ruth Lipschutz. Principal and interest of the fund will be used over a ten year period in granting awards to fourth year medical students writing the best essay in the field of pediatrics. The fund honors Dr. Lipschutz, formerly clinical instructor of pediatrics at the school, who met death while serving with the Navy in the Guadalcanal campaign.

PENNSYLVANIA

Course on Industrial Medicine.—The Lackawanna County Medical Society recently sponsored a course of ten sessions reviewing the subjects of industrial medicine and hygiene. The course was given under the direction of Lieut. Col. Arthur P. Hitchens, U. S. Army retired, George S. Pepper professor of preventive medicine and public health, University of Pennsylvania School of Medicine, Philadelphia. The program included speakers from the U. S. Public Health Service, including Medical Director Louis Schwartz, on "Occupational Dermatoses"; Principal Statistician William M. Gafafer, "Maintenance of Manpower," and Associate Statistician Hugh P. Brinton, "Women in Industry." In addition there were a number of speakers from various state departments in Pennsylvania.

Philadelphia

Dr. Landis to Lecture at Pennsylvania.—Dr. Eugene M. Landis, George Higginson professor of physiology at Harvard Medical School, Boston, will deliver the fourth annual Phi Delta Epsilon Honor Lecture at the University of Pennsylvania School of Medicine, April 14. His subject will be "A Comparison of the Clinical Tests of Kidney Function."

Course in Tropical Diseases.—The department of public health and preventive medicine, University of Pennsylvania School of Medicine, will inaugurate a Saturday afternoon course April 8 on epidemiology. Physicians and others interested may attend the course, which will place emphasis on the epidemiology of tropical diseases. *Philadelphia Medicine* reports that the tropical medicine section of the course is being organized so that the new sixth edition of the work on tropical diseases of Rear Admiral Edward R. Stitt, surgeon general, U. S. Navy, retired, prepared by Col. Richard P. Strong, M. C., A. U. S., will be used to guide and supplement the course.

Pittsburgh

Course in Tropical Diseases.—The committee on graduate education of the Allegheny County Medical Society is sponsoring a course on parasitology and tropical diseases for practicing physicians. The course will include a series of eight lectures to be given by Dr. Evelyn L. Heller, instructor in pathology, University of Pittsburgh School of Medicine. The lectures began April 5 and continue through May 24.

TEXAS

Council Created for Group Service Plan.—A new council on hospital service plans was recently organized in Texas to aid the expansion of group hospital service of Texas, to make recommendations relative to this work through the Texas Hospital Association, to advise with group hospital service and to coordinate the council activities with the administration of group hospital service. Mr. Lawrence Payne, superintendent of Baylor University Hospital, Dallas, is chairman.

University News.—The University of Texas Medical Branch, Galveston, has received a grant of $2,400 from Frederick Stearns and Company, Detroit, to support a fellowship in pharmacology. A similar grant from the Bilhuber-Knoll Company of Orange, N. J., has also been given toward a fellowship in pharmacology.—Recent appointments to the faculty of Baylor University College of Medicine, Houston, include John H. Perry, Ph.D., as assistant professor of anatomy, Dr. Paul A. Wheeler, associate professor of pathology, and Samuel Earl Kerr, lieutenant in the medical corps, Army of the United States, instructor in pathology.

UTAH

Dr. Ogilvie Resigns.—Dr. Orin A. Ogilvie has resigned as professor of bacteriology and pathology at the University of Utah School of Medicine, Salt Lake City, effective March 11.

VERMONT

University News.—A grant of $1,500 has been made to Dr. Louis S. Goodman, professor of pharmacology and physiology at the University of Vermont College of Medicine, Burlington, by the Abbott Laboratories, North Chicago, Ill., for the study of synthetic anticonvulsants and analgesics.—Corrine Manuel, B.S., M.T., has been appointed research assistant in the department of pharmacology and physiology.

VIRGINIA

Changes in Health Officers.—Dr. Thomas Scarlett, health officer of Harrisonburg, resigned, effective February 12, to enter military service.—Dr. Thomas F. McGough Jr., health officer of Pulaski-Wythe Health District, Pulaski, resigned effective February 16 to enter military service.—Dr. Daniel C. Steelsmith, health officer of Halifax-Pittsylvania Health District, South Boston, has resigned effective April 1.

WASHINGTON

New Director of Venereal Control.—Edwin N. Hesbacher, assistant surgeon, U. S. Public Health Service, has been appointed director of venereal disease control of the Seattle Health Department. He succeeds Dr. Burton L. Zinnamon, who has been transferred to Oakland, Calif.

City Creates Post of Municipal Psychologist.—The Seattle city council has been asked to establish a new municipal civil service position of psychologist to be used in connection with the treatment of women with venereal disease. According to *Northwest Medicine*, it was stated that the salary would be paid by the Federal Works Agency. Besides making a study of these patients, the psychologist would assist the social worker in placing them in industry.

Hospital News.—A gift of 81 acres in West Seattle by the King County commissioners to the federal government for the establishment of a veterans' hospital has been rejected because additional veterans construction in Washington is not under consideration.—The new Franklin D. Roosevelt Hospital, Bremerton, constructed at a cost of nearly $1,000,000 from government funds, has been recently opened. It is county sponsored but will not be operated as a charity institution.

WEST VIRGINIA

Impostor Turns to Industrial Practice.—"Dr." Samuel Seymour Liebowitz, alias Charles Freeman Krueger, alias Samuel Seymour Strauss, has reappeared in West Virginia, seeking work as an assistant in industrial medical practice in the coal fields near Charleston. In his application, Liebowitz stated that he was a graduate of a foreign school, had taken his junior and senior years in medicine at the University of Pennsylvania and was licensed in Missouri and New York. He said further that he was a member of the staff of Spencer State Hospital (mental) at Spencer and that the public health council had given him a special permit to practice at that institution. An investigation by the West Virginia State Medical Association disclosed that no person by the name of Liebowitz had been connected with the Spencer institution and that no special permit to practice had been granted by the public health council to a doctor of that name. A physician at the coal fields ordered Liebowitz out of West Virginia. Liebowitz, on being advised to get out of the state, left the coal fields immediately but on March 21 turned up in Charleston on some trivial pretext in the offices of the state medical association. After considerable questioning, he admitted that he was "the same Liebowitz who 'practiced' in the coal fields of West Virginia in 1940 under the name of 'Dr. S. S. Strauss,' posing as a graduate of Long Island College of Medicine, Brooklyn, and as a regularly licensed physician in West Virginia. He also admitted that he had served time in the federal reformatory at Chillicothe, the Northwestern Penitentiary at Lewisburg, Pa., the U. S. Penitentiary at Atlanta and the U. S. Penitentiary at Terre Haute, Ind. The federal court records in West Virginia show that at the March 1941 term of the U. S. District Court for the northern district, at Parkersburg, Liebowitz was convicted on a charge of falsely and incorrectly registering for the draft and sentenced to serve two years at Atlanta. He states that he was later transferred to Terre Haute. He was paroled from the Terre Haute prison Oct. 26, 1942 and placed under the jurisdiction of the U. S. probation officer at South Bend, Ind. His conviction at Parkersburg in 1941 followed months of posing as a doctor and 'practicing' in various parts of the country, including relief work in many towns in the coal fields in West Virginia." A report of a thorough investigation by federal officers to the West Virginia State Medical Association revealed that Liebowitz had had no medical training whatever but had worked as an orderly in federal reformatory hospitals. "Liebowitz, while freely admitting the truth of most of the evidence with which he was confronted, stoutly maintained that he is a graduate of the 'University of Vienna,' class of 1939, and that he had interned at 'Westminster Hospital, London,' in 1940, coming to the United States in March 1940. He stated that he had had several jobs since his parole from Terre Haute, working in Whiting, Ind., and at Louisville, Ky. He said he came back to West Virginia because he had no work and because he is 'qualified to practice medicine in the coal fields.'" At the time of his visit to the offices of the state medical association he was advised to leave West Virginia without delay. Exhibiting a bus ticket, he stated he had decided to get work on a farm and was leaving that afternoon for Philadelphia. Members of the medical profession in West Virginia are requested to watch for "Dr." Liebowitz and to notify Dr. John E. Offner, state health commissioner and secretary of the public health council, if he should turn up in their community. Liebowitz first appeared at the headquarters of the

state medical association in 1940, giving his name as S. S. Strauss and saying that he was a graduate of the Long Island College of Medicine and that he was licensed to practice in West Virginia. He obtained positions doing relief work in various towns in the coal fields but disappeared when it became known that he was not licensed and had not graduated from the Long Island College. In Kingwood, state police took him in custody as a suspicious character and discovered that, while his automobile license was in the name of Samuel Strauss, his draft registration card bore the name Kreiger. The police notified the U. S. Department of Justice, which sent back a police record dating from 1933. He has used various aliasis, including Seymour Rothchild, Seymour Davis Strauss, Milton Fenberg, Seymour Strauss, Samuel Liebowitz and Samuel Seymour Strauss. His activities had been carried on in a number of states and his sentences included terms in various penal institutions for using the mails to defraud and one for vagrancy.

GENERAL

Society News.—The American Association for the Advancement of Science will hold its 111th annual meeting in Cleveland, September 11-16.

Cumulative Index of Radiology.—The Radiological Society of North America has just issued a cumulative index of its official publication, *Radiology*, covering the years 1923-1942, volumes 1-39. In the organization of the index the *Quarterly Cumulative Index Medicus*, published by the American Medical Association, has been used as a pattern.

Orthoptic Examinations.—The American Orthoptic Council announces that applications for the next examinations must be received before August 1. The written examinations will be held in various cities throughout the country on September 7. Only those passing the written examinations will be permitted to take the oral and practical tests, to be given in Chicago on October 7. The address of the council is 23 East 79th Street, New York 21.

New Managing Director for Society for the Hard of Hearing.—Mr. Raymond H. Greenman, formerly executive secretary of the Tuberculosis and Health Association of Rochester and Monroe County, New York, has left a war assignment with the American Social Hygiene Association to become managing director of the American Society for the Hard of Hearing, Washington, D. C. Mr. Greenman succeeds Miss Betty C. Wright, who is on a three months leave of absence from the society to serve with the American Red Cross as consultant in three army hospitals for the special care of deafened soldiers. Miss Wright will return to the society in August as director of field service. The society also announces that it is embarking on a war activity aimed to meet, through the cooperation of its 121 local chapters, the rehabilitation needs of the war deafened soldiers. The society will observe its twenty-fifth anniversary this year.

Tropical Medicine News.—The first issue of *Tropical Medicine News*, published by the American Society of Tropical Medicine, made its appearance with the February issue. The bulletin is aimed to keep members in touch with happenings within the society and will appear bimonthly during the months when the *American Journal of Tropical Medicine*, the official organ of the society, also a bimonthly publication, is not published. The *News* has been so planned that it will be self supporting as the result of pharmaceutical advertising. The notices of three firms are to appear in alternating position on the back cover and the inside cover pages of each issue. The space for the six issues of 1944 has been purchased by Eli Lilly & Company, G. D. Searle & Company and John Wyeth & Brother, Inc. The cover of the *News* is the work of the art department of Tulane University of Louisiana School of Medicine, New Orleans, and has been adopted from the seal of the society. The seal itself depicts a seated Roman goddess, in a tropical setting, who extends the lamp of knowledge to the serpent, the symbol of healing. The anopheline mosquito, the scorpion and the leaves and open flower of Cinchona ledgeriana have been added at the base of the seal, and the motto of the society, Salus in Tropica, has been retained. The first issue contains a report of the 1943 meeting of the society, clinical and research notes, news items and a list of the officers.

LATIN AMERICA

Health Activities in Latin America.—*Brazil Supervises Penicillin Manufacture.*—The manufacture of penicillin was placed under government supervision and its export was prohibited on March 8 by President Getulio Vargas, the New York *Times* reported. It was stated that a few days before a large consignment was found at Rio Grande do Sul on an airplane bound for Argentina. Recently Brazil sent penicillin to Spain, the United States and Great Britain. The drug is produced in both Rio de Janeiro and São Paulo states. On March 8 the government also voted $200,000 to increase production.

Society News.—New officers of the Sociedad Cubana de Urologia include Drs. José A. Hernández, Ibañez, president; Luis F. Ajamil, vice president; Ramiro de la Riva and Luis Hernández Hernández, secretaries, and Ernesto Puget and Gabriel Vandama, treasurers.

Assistance in Venereal Care.—On March 14 the executive council of Puerto Rico adopted a resolution accepting the offer of the United States of America to contribute to the people of Puerto Rico ($167,632) for the maintenance and operation of venereal disease hospital facilities at Cayey, Maricao, Caguas and Finca Troche. The gift will extend through June 30.

Personal.—Lieut. Col. Edgar Tostes, Panair do Brasil, head of the Aeronautical Hospital, Brazil, was recently awarded the diploma of honor of the Association of Military Surgeons of the United States in recognition of his "outstanding contribution to military medical care in the Western Hemisphere," according to an announcement from the Pan American Airways System.

FOREIGN

Personal.—On January 13 Sir Henry H. Dale, president of the Royal Society and director of the laboratories of the Royal Institution, London, was presented with the Hanbury Memorial Medal of the British Pharmaceutical Society.—— The honorary gold medal of the Royal College of Surgeons, London, was presented at the Buckston Browne luncheon at the college on February 12 to W. H. Collins, chairman of King Edward VII Hospital, Windsor, in recognition of his gift of £100,000 (THE JOURNAL, Nov. 27, 1943, p. 851) to endow the department of pathology, with provision for a further like sum to extend and develop the department of pathology at Lincoln's Inn Fields and to found there a chair of human and comparative pathology.——The Rockefeller Foundation has made an appropriation of £1,200 for biochemical investigations of penicillin under the direction of Howard Walter Florey Ph.D., professor of pathology at the University of Oxford.

King's Physician Terms Health Plan "Despotism."—The King's physician, Viscount Dawson of Penn, asserted in the House of Lords, London, that "signs of the new despotism" were in the White Paper outlining the health scheme recently presented to Parliament (THE JOURNAL, March 18, p. 789). According to the New York *Times* the debate in the two houses of Parliament was initiated on motions indicating the government's intention to establish a comprehensive health program. The purpose of the debate, it was stated, was to obtain criticisms of the plan before drafting a bill to effectuate it. The *Times* stated that criticisms came in a downpour, especially from some of the eighteen doctors in the two houses. The suggestion was made that the doctors would be assigned "beats like a policeman or a postman and paid like schoolmasters." In the House of Commons, the *Times* continued, Minister of Health Henry U. Willink commenced discussion with a conciliatory speech aimed at placating those doctors who regard the plan as a threat to their independence. "No one, patient or doctor, must be dragooned into any part of this service," Mr. Willink said. He assured the House that the government did not intend to regiment doctors, prohibit private practice or eliminate voluntary hospitals—that is, hospitals supported by public contributions. The doctors disagreed violently in the ensuing argument, it was stated. Sir Ernest G. Graham-Little, internationally known skin specialist, asserted, despite a tart challenge from Dr. Edith C. Summerskill, vice president of the Socialist Medical Association, that the "vast majority" of doctors who must operate the scheme would be "intensely resentful of the conditions imposed on them." Dr. Leslie Haden Guest, demanding removal of commercialism from the profession, also denied Sir Ernest's claim to represent a large part of the medical profession, and Mr. Alexander G. Walkden said to Mr. Willink "Young doctors welcome your scheme." Replying to a government statement by Lord Woolton, minister of reconstruction, Lord Dawson criticized the way in which the White Paper seemed to introduce a salaried service for doctors and said that civil service control would mean "goodbye to the best that medicine can do." Mr. Willink described the plan as the "biggest single advance ever made in this country in the sphere of public health"—a scheme to make the whole range of health care available to every person, the cost to be shared by the beneficiaries and the taxpayers.

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 4, 1944.

The Medical Press and the National Health Service

A qualified welcome is given by the *British Medical Journal* to the government plan for a national health service. The recent white paper on this subject is characterized by the *British Medical Journal* as well written and for the most part unambiguous. For the moment, those who are opposed to a whole time salaried state medical service have had their fears allayed. But the suggestion that a central medical board should have power to prevent doctors from entering an "overdoctored" area and that no one should practice anywhere without first obtaining permission of the board, a civil service structure, is held to be more than a hint of authoritarianism. The white paper states that "the board must be able to require the young doctor during the early years of his career to give his full time to the public service where the needs of the service require this." This seems to conflict with the principle of "no compulsion into the new service of either patient or doctor." The *British Medical Journal* sees in the white paper the unmistakable direction in which the government is moving—toward the institution of a whole time salaried service, with the proviso that private practice shall not be denied to those who want it and that doctors in the public service may provide it. "It is difficult to see how, in the kind of evolutionary changes which are so persuasively outlined, private practice as we know it today can survive much more than as a shadow of itself. Our contemporary detects a thread of argument and development leading in a direction which the profession refuses and will refuse to follow—that of whole time salaried service under the state," it is declared.

The *Lancet* also welcomes the white paper and characterizes the scheme as "bold as well as reasonable." It holds that "within the framework suggested it would be possible soon to increase the value of medical knowledge to the public, to give most doctors more satisfaction in their work, and in doing so to prepare the way for a really fine service in the years to come." The new service must set itself from the first to make more economical use of the doctors available, the *Lancet* says. This, it is held, can be achieved only by rapid development of the health centers, which would do something to conserve the doctor's time and energy.

New Cooperative Program of British Empire Cancer Campaign

One of the most important duties of the British Empire Cancer Campaign has been to review new suggestions as to the cause and treatment of cancer. In the past, the conclusions formed have not always reached the medical profession. The campaign has now expressed its willingness to give its opinion on any new form of treatment on which it has information. It will continue to investigate methods of treatment and theories of causation and is willing to undertake or promote research into these, provided the following conditions are fulfilled: 1. That in the opinion of the appropriate expert committee of the campaign the subject offers any prospect of advancing the solution of the cancer problem. 2. That the fact that a theory or suggested treatment is being investigated by the British Empire Cancer Campaign shall be disclosed only with the consent of the campaign. This condition seems to be laid down to prevent exploitation of the fact that an alleged remedy is being investigated by the campaign. 3. That the campaign reserves to itself the right to publish in an appropriate manner the conclusions reached, whether favorable or unfavorable. 4. That in the case of theories concerning causation all available information shall be furnished by the advocate of the theory on the scientific basis and the experimental data, which shall be so detailed that exact repetition of the experiments can be carried out by experts in the field concerned. 5. That in the case of methods of treatment the precise nature, composition and method of administration shall be disclosed and the evidence shall be collected in accordance with safeguards as to scientific accuracy which experience has shown to be essential, namely (*a*) that cases shall be of proved cancer as far as proof is practicable, preferably by microscopic examination (if possible also they should be cases affecting accessible organs such as the skin, breast, cervix uteri and mouth), (*b*) that every case treated shall be recorded whether the result is favorable or otherwise, and (*c*) that clinical records, including follow-up, shall be as full as possible. 6. That in the case of treatment based on experiments the campaign reserves to itself the right to confirm the results of such experiments before attempting clinical trials of the remedy. The campaign also announces that it will be happy to arrange for physicians to discuss their hypotheses and experiences with appropriate experts. The address of the campaign offices is 11 Grosvenor Crescent, London S.W. 1.

Special Investigation of Diseases and Care of the Aged

Two important changes are evident in the British population: a fall in its rate of increase, with a decrease imminent, and an increase in the average length of life. At the beginning of the century 2,250,000, or 1 in 17 of the population, were of pensionable age (65 for men and 60 for women). By 1941 this figure had risen to 5,500,000, and it is calculated that by 1961 it will be over 8,000,000, or 1 in 6 of the population. These facts provide a serious problem for our public health authorities in their care of the aged. The Nuffield Foundation trustees are undertaking a survey of the problems of aging and the care of old persons. The Ministry of Health has warmly welcomed the proposal and will cooperate. The object of the survey is to collect and collate information on (1) the problems, individual, social and medical, associated with aging and old age, (2) the work being done by public authorities and voluntary organizations and the public and private resources that exist for the care and comfort of the old, (3) the provision made for old persons in other countries which have given special consideration to the problem, (4) medical research on the causes and results of aging and (5) the lines on which action might be usefully taken in the future by public authorities and private organizations, including the Nuffield Foundation. Questions of medical research will be considered by a special subcommittee of leading physicians.

It is remarkable that while the diseases of children have, rightly, received a great deal of attention, those of persons at the other end of life have not been similarly investigated. Much of course is known about the pathologic changes in the aged, but the trustees hold that in questions of aging and the care of the aged there is lack of collated information of a comprehensive and authoritative nature. This militates against proper appreciation of the problems involved and hinders the search for adequate solutions. The survey now undertaken should lead to an important contribution to better understanding of a social problem which will inevitably occupy an increasingly important place in public thought and policy. It will also provide the Nuffield Foundation with a proper basis on which to decide its future action with regard to the care of old persons. The present population trend has already influenced mortality statistics. Certain diseases of the elderly, such as cancer, already show an absolute increase in number.

A Modern Hospital and Medical School for Ethiopia

During the years 1936 to 1941, when Italy exerted an uneasy rule over Ethiopia, the emperor lived in England. His daughter, Princess Tsahai, undertook training as a nurse at our principal children's hospital, the Hospital for Sick Children, on Great Ormond Street. After passing the examinations qualifying her as a nurse, she entered Guy's Hospital for further training. Her object was to fit herself to lead a movement for establishing a modern nursing service in Ethiopia when its freedom was regained. But, unfortunately, she died in 1942, at the age of 22. An appeal is now being made for funds to found in Ethiopia a modern hospital and medical school in her memory as a token of good will from the people of Britain. The appeal is supported by the leaders of the medical and nursing professions.

BRAZIL

(From Our Regular Correspondent)

Feb. 20, 1944.

Low Cost Collective Feeding

As a result principally of continued effort by modern physicians in Brazil, the eating habits of the population are being changed for the better: old, unbalanced and incomplete diets are being abandoned and new customs are being created, especially among the higher classes. This was and still is a recognized necessity, because the Brazilian common diet is, as a rule, defective, monotonous and insufficient for the active life that a large part of the population is now beginning to adopt. Some aspects of this problem may be grasped from a paper that has just been published by Drs. Olavo Rocha and J. Fleiuss, in which they describe their work to organize, on a modern basis, the furnishing of more than a millon meals to some 2,000 workers at the Fabrica Nacional de Motores, the Brazilian national airplane motor factory located in a distant suburb of the city of Rio de Janeiro. The cost of the meals is considered rather low (roughly corresponding to 10 cents per meal), if present war conditions are taken into consideration. The task of furnishing the meals had been previously given to a nutrition and social welfare organization which is pioneering in the difficult field of furnishing low cost, collective feeding of proper quality. The meals were sent to the factory in thermal trucks. Despite the fact that the food supplied was prepared with the best quality of foodstuffs and had excellent appearance, quite unexpectedly at the end of about a month the workers and even the administrative staff of the factory began to complain about the food, showing some degree of aversion toward it. Some of the results of the study made by Drs. Rocha and Fleiuss of the causes of this intolerance and the measures taken to correct them are summarized here.

The so-called rational diets of the welfare organization were generally based on calory calculations and on the minimum protein, vitamin and mineral salt content, little emphasis being put on the taste and variety of the foods. In the effort to organize scientific and balanced diets, the menus departed too far from the eating habits of Brazilian workers, it was found, and were typically monotonous. The authors convinced the management of the factory that the meals should be prepared at its site. Within the list of foods most readily found in the market and most commonly in use, they planned a great variety of menus. They recognized the fundamental importance, in collective feeding, of the taste of the food, which in large part depends on flavoring and seasoning, a factor which plays a prominent part in the digestibility of the food. The authors suggested that the flavoring might not be limited to the habitual seasonings—salt, vinegar, garlic, onion, tomato and tomato catsup—used in the dishes furnished by the organization. They proposed to increase the amounts of these seasonings four and five times. In the food prepared at the factory, these seasoning agents have reached the daily amounts per person of garlic 1 Gm., onion 10 Gm., tomato 8 Gm. and vinegar 5.5 cc. They suggested further that other flavorings, like laurel leaves, parsley, pimento and annato seeds (Bixa orellana), be used. It is to be noted that this practice did not materially increase the number of digestive disturbances. The only important reactions were registered in connection with a small number of workers presenting some kind of allergy or with organic lesions of the digestive or circulatory systems (hyperchlorhydria with or without peptic ulcers, biliary troubles, chronic colitis [mainly amebic] and hypertension with some degree of nitrogen retention).

All the meals furnished by the social welfare organization included a glass of milk, which the workers were not accustomed to take at lunch and dinner time. Most of the workers do not like to take milk at all; they even regard it with aversion, saying that it is "a food for sick men, for weak men, for frail girls, for women in childbed" and not suitable for "full grown men, strong men, men who have to do hard work." But as a result of this educational effort the workers are being trained to take milk with the morning coffee.

The authors state that the correction of the monotony of the diet and the increase in the seasoning of the dishes have accounted for a decided improvement in the acceptance of the food. Thus adequate amounts of food are now enjoyed, as well as proper quality, a fact that is a feature of the present system of feeding workers at the factory.

The Death of Fernando Magalhães

Dr. Fernando Magalhães, professor of obstetrics at the University of Rio de Janeiro, died a few days ago at the age of 64. He was one of the leading medical men of Brazil and was considered the pioneer of modern obstetrics in this country. He was still young when he took the full professorship of obstetrics at the university, after a competitive selection which aroused great interest in medical circles at the time. He was also elected a member of the Brazilian Academy of Medicine, the highest professional association, constituted, as a rule, by the elder representatives of the principal medical specialties in the country. He was actually a reformer of obstetrics in Brazil, not only by his teaching in the principal medical school of the country but, mainly, as the leader of a campaign to introduce the use of the best technic in his specialty. The modern treatment of puerperal sepsis, the use of cesarean section when necessary, the problem of painless childbirth, the right conduct in case of placenta previa, cancer of the uterus, correct forceps technic—these are some of the problems to which he devoted his best efforts. He was an open minded physician and a courageous fighter for his professional ideals. In 1918 he founded the Pro-Matre Hospital, a modern private maternity hospital where he had the best field for his studies and teachings and where many leading obstetricians of the present time began their careers. One of his students, Dr. C. Correa da Costa, is now director of the Arthur Bernardes Maternity, where he has achieved spectacular results in the control of puerperal sepsis by applying the principles taught by Dr. Magalhães.

Marriages

William R. Dandridge, Charlottesville, Va., to Miss Hetty Wray Hurd of Martinsville in Strasburg, March 3.

Oliver Bryson Wingo to Miss Dorothy Bartlett, both of Birmingham, Ala., in Scottsboro recently.

Charles L. Benson, Tamaqua, Pa., to Miss Marjorie J. Duffy of East Mauch Chunk, January 1.

Earl L. Loyd, Salina, Kan., to Miss Margaret Elizabeth Stevens of Minneapolis in February.

Deaths

Robert Anthony Hatcher ✠ Flushing, N. Y., noted pharmacologist, died April 1 of angina pectoris, aged 76.

Dr. Hatcher was born in New Madrid, Mo., Feb. 6, 1868. He received his Ph.G. at the Philadelphia College of Pharmacy in 1889, graduating at Tulane University of Louisiana School of Medicine, New Orleans, in 1898. Honorary degrees that were later conferred on him included the master in pharmacy from his alma mater and a doctor of science in pharmacy from Columbia University. He was professor of materia medica at the Cleveland School of Pharmacy, 1899-1904, and demonstrator of pharmacology at Western Reserve University School of Medicine, Cleveland, 1901-1903. He went to Cornell University Medical College as instructor in pharmacology in 1904; he was assistant professor of pharmacology and materia medica there from 1906 to 1908 and professor from 1908 until 1935, when he became professor emeritus.

At the time of his death Dr. Hatcher was one of the few remaining charter members of the Council on Pharmacy and Chemistry of the American Medical Association. He had served continuously as a member of the Council since 1905, when it was created. In 1943, when he retired at the age of 75, the Board of Trustees of the American Medical Association made him an honorary life member, the first member of the Council ever to receive this recognition. He was chairman of the Section on Pharmacology and Therapeutics of the American Medical Association from 1915 to 1916 and a member of the House of Delegates of the Association in 1917.

Dr. Hatcher was a recognized authority on digitalis. Much of the success of the Council on Pharmacy and Chemistry is attributed to his efforts. Up until the time of his retirement in 1943 he was constantly busy with the preparation and editing of reports, retaining the interest that had made him an able influence in the development of the Council.

His contributions in the field of research and education are widely known. Dr. Hatcher was a member of a number of scientific groups including the American Association for the Advancement of Science, the American Pharmaceutical Association, the American Physiological Society, the American Society of Biological Chemists, American Society for Pharmacology and Experimental Therapeutics and the Harvey Society. Included among his many writings were the "Textbook of Materia Medica," of which Dr. Torald H. Sollmann was co-author, 1904, and "Pharmacology of Useful Drugs" (with M. I. Wilbert) 1915. He served for a time as editor of Useful Drugs.

ROBERT ANTHONY HATCHER, M.D., 1868-1944

Morris Manges ✠ New York; College of Physicians and Surgeons, New York, 1887; member of the American Climatological Association, New York Pathological Society, American Gastro-Enterological Association, Harvey Society, American Association for the Advancement of Science, Archeological Institute of America and Oriental Institute of the University of Chicago; fellow of the New York Academy of Medicine; professor of clinical medicine at the New York Polyclinic Medical School and Hospital from 1898 to 1908 and for many years clinical professor of medicine at the University and Bellevue Hospital Medical College; served on the staff of the Mount Sinai Hospital; formerly consulting physician to Hospital for Joint Diseases, and Hebrew Orphan Asylum; editor of "Ewald's Diseases of the Stomach" in 1892 and 1896; died January 26, aged 78, of coronary thrombosis.

Hugh White Priddy, Memphis, Tenn.; University of Tennessee College of Medicine, Memphis, 1915; member of the Tennessee State Medical Association; member and in 1939 vice president of the Southern Psychiatric Association; president of the Memphis Hospital Association in 1933; formerly assistant in medicine, neurology and psychiatry and instructor in neurology and psychiatry at his alma mater; served as a lieutenant during World War I; at one time part owner of the Leigh and Priddy Hospital, Charleston, Miss., and the Wallace Sanitarium; served on the staffs of the Memphis General and Baptist Memorial hospitals and the Home for Incurables; member of the Memphis Rotary Club; died January 17, aged 56, of myocardiac insufficiency.

Charles Allen Riley ✠ Boston; Jefferson Medical College of Philadelphia, 1905; assistant in pulmonary diseases from 1910 to 1916, instructor, pulmonary diseases from 1916 to 1925, instructor, pulmonary diseases and climatology from 1925 to 1929 and instructor in medicine from 1932 to 1934 at Tufts College Medical School; captain in the medical corps of the U. S. Army during World War I; on the active staff of the health department of Boston and consultant for the health department of Newton; on the staffs of the Boston Dispensary and Boston Sanatorium; on the staff of the Brooks Hospital, Brookline; died January 30, aged 62, of coronary thrombosis.

Oliver S. Bacon, St. Louis; Missouri Medical College, St. Louis, 1889; died in Maplewood, Mo., January 19, aged 79, of chronic endocarditis.

Milton Reed Barker, Wilmette, Ill.; Chicago Homeopathic Medical College, 1890; Northwestern University Medical School, Chicago, 1901; for many years on the staff of St. Francis Hospital, Evanston; died February 3, aged 92, of coronary thrombosis and endocarditis.

John Henry Richard Barry, Forest Hills, N. Y.; College of Physicians and Surgeons, New York, 1890; member of the Medical Society of the State of New York; past president of the Queens-Nassau Medical Society; in 1938 retired after thirty years as assistant sanitary superintendent department of health for the borough of Queens; served on the staff of St. John's Long Island City Hospital, where he died March 10, aged 75, of angina pectoris.

Edgar Bates, Ogden, Utah; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1900; formerly associated with the Indian Service at Warm Springs, Ore.; died January 24, aged 74, of complications following a fall, and senility.

Galen Sibley Battey, Cawker City, Kan.; the Hahnemann Medical College and Hospital, Chicago, 1880; died January 21, aged 88, of cerebral hemorrhage.

George Andrews Cooke, Boston; Long Island College Hospital, Brooklyn, 1891; school physician of Montague, Mass., for many years; cofounder of the Franklin County Public Hospital, Greenfield; died recently, aged 77, of heart disease.

Morris W. Cowden, Gerry, N. Y.; University of Buffalo School of Medicine, 1890; for more than fifty years health officer of the town of Gerry; died January 24, aged 82, of chronic myocarditis and arteriosclerosis.

Aloysius Francis Dowd, Boston; Tufts College Medical School, Boston, 1919; died recently, aged 48.

Walter L. Gaines, Wheeler, Texas (licensed in Texas under the Act of 1907); died in a hospital at Spur, January 6, aged 67.

Ernest H. Gibbs ✠ Pittsburgh; Detroit College of Medicine, 1910; died in the Presbyterian Hospital January 11, aged 55, of congestive heart disease.

Albert Donne Gibson, Port Lavaca, Texas; Wisconsin College of Physicians and Surgeons, Milwaukee, 1897; member of the State Medical Association of Texas; served as city health officer and as acting assistant surgeon in the U. S. Public Health Service; died in the De Tar Memorial Hospital, Victoria, January 6, aged 69, of uremia.

Ernest Reed Hirst ✠ Camden, N. J.; Jefferson Medical College of Philadelphia, 1918; member of the American Academy of Ophthalmology and Otolaryngology; specialist certified by the American Board of Otolaryngology; on the staffs of the Zurbrugg Memorial Hospital, Riverside, and the Cooper Hospital, where he died January 27, aged 51, of coronary thrombosis.

George Hofstetter ✠ Clinton, Iowa; Rush Medical College, Chicago, 1882; an Affiliate Fellow of the American Medical Association; on the staffs of the St. Joseph, Mercy and the Jane Lamb Memorial hospitals; died January 28, aged 86, of paralysis agitans.

Lydia Heckman Holmes, Pekin, Ill.; Loyola University School of Medicine, Chicago, 1917; member of the Illinois State Medical Society; past president and vice president of the Tazewell County Medical Society; at one time medical director and superintendent of the Fairview Sanatorium (McLean County Tuberculosis Sanatorium), Normal; on the staff of the Pekin Public Hospital, where she died January 22, aged 72, of diabetes mellitus.

John Robert Hood, Indiahoma, Okla.; Hospital College of Medicine, Louisville, Ky., 1897; died in Lawton January 18, aged 74, of vascular degeneration and renal disease.

Arthur Ernest Jessup, Diagonal, Iowa; State University of Iowa College of Medicine, Iowa City, 1895; member of the Iowa State Medical Society; died January 12, aged 74, of cardiorenal disease.

Horace G. Lamb, Santa Rosa, Calif.; California Medical College, San Francisco, 1901; died January 20, aged 83.

Richard Percy Landis, Vallejo, Calif.; University of Oregon Medical School, Portland, 1918; served during World War I; at one time owner of the Landis Clinic and Hospital, Grass Valley; died in the Vallejo General Hospital January 24, aged 54, of cerebral hemorrhage.

Clyde Raymond Larkins ✠ East Liverpool, Ohio; Jefferson Medical College of Philadelphia, 1903; president of the board of trustees and member of the staff, East Liverpool City Hospital; died January 29, aged 68, of heart disease.

LIEUT. WARD R. VINCENT (MC), U.S.N.R., 1914-1943

Waldo Nathaniel Lemmon, Hereford, Texas; Barnes Medical College, St. Louis, 1899; member of the State Medical Association of Texas; also a minister; at one time a medical missionary in the Philippine Islands; past president of the Meade-Seward Counties (Kan.) Medical Society and the Randall-Deaf Smith-Parmer-Castro-Oldham Counties Medical Society; on the staff of the Deaf Smith County Hospital, where he died January 1, aged 71.

Andrew De Witt Mahaffay, San Juan, Texas; Hahnemann Medical College of the Kansas City University, Kansas City, Mo., 1902; member of the chamber of commerce; died January 12, aged 78, of injuries received in an automobile accident.

George Robert Mankis, Providence, R. I.; Hahnemann Medical College and Hospital of Philadelphia, 1932; on the staffs of the Homeopathic Hospital and St. Joseph's Hospital, where he died January 23, aged 37, of cerebral hemorrhage.

Thomas Gordon McCleary, Excelsior Springs, Mo.; Hahnemann Medical College and Hospital of Philadelphia, 1921; died January 9, aged 46, of brain tumor.

John E. Meany, Manitowoc, Wis.; Milwaukee Medical College, 1898; honorary life member of the State Medical Society of Wisconsin; past president and secretary of the Manitowoc County Medical Society; formerly city health officer; served on the staff of the Holy Family Hospital, where he died January 19, aged 81, of general carcinoma.

Albert J. Muckerheide, Milwaukee; Milwaukee Medical College, 1900; member of the State Medical Society of Wisconsin; died January 24, aged 69, of cerebral hemorrhage.

Ralph Edgar Niedringhaus ✠ St. Louis; St. Louis College of Physicians and Surgeons, 1898; served as a captain in the medical corps, U. S. Army, during World War I; at one time a member of the Illinois State Board of Health; died January 19, aged 66, of carcinoma of the cecum and cerebral arteriosclerosis.

Maud Parker, Seattle; Cornell University Medical College, New York, 1905; member of the Washington State Medical Association; served as a member of the board of trustees of the King County Medical Society and as secretary of the Medical Women's National Association; formerly on the staffs of the Seattle General and Swedish hospitals; died January 16, aged 66, of tuberculosis.

Walter Andrew Poche, Kaplan, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1902; died in Our Lady of the Lake Sanitarium, Baton Rouge, recently, aged 68, of coronary occlusion.

Leonard Holden Pote, Somerville, Mass.; Harvard Medical School, Boston, 1900; member of the Massachusetts Medical Society; died in Boston recently, aged 69, of carcinoma of the prostate.

James Frederick Roach, Centralia, Ill.; Missouri Medical College, St. Louis, 1896; served during World War I in France and later in Siberia; at one time affiliated with U. S. Veterans Bureau and the U. S. Public Health Service; died in West Palm Beach, Fla., January 26, aged 69, of diabetes mellitus and heart disease.

Maurice S. Schimmel ✠ Baltimore; Baltimore University School of Medicine, 1895; died in the Sinai Hospital January 12, aged 74, of bronchopneumonia and carcinoma of the liver.

Ivan W. Staples, Norway, Maine; Medical School of Maine, Portland, 1909; member of the Maine Medical Association; at one time examiner for the U. S. Pension Board; died recently, aged 60, of angina pectoris.

William D. Townley, Chamois, Mo.; Missouri Medical College, St. Louis, 1882; died in St. Mary's Hospital, Jefferson City, January 26, aged 84, of heart disease.

Isaac Johnson Townes ✠ Madisonville, Ky.; Jefferson Medical College of Philadelphia, 1889; vice president of the Hopkins County Medical Society; died in Mayfield January 22, aged 76, of coronary thrombosis.

Harwood Vernon, Verona, N. J.; University of Vermont College of Medicine, Burlington, 1895; died January 17, aged 75, of arteriosclerotic heart disease.

Redone Edgar Wasson, Fairview, Ill.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1906; member of the Illinois State Medical Society; director of the Fairview State Bank; died in the Graham Hospital, Canton, January 22, aged 78.

Harry J. Wertman ✠ Milford, Neb.; Rush Medical College, Chicago, 1903; for many years member and chairman of the board of education; served as a member of the fire department; died in Alhambra, Calif., January 26, aged 66, of cerebral hemorrhage and arteriosclerosis.

Leo Sheldon Wright, Lowry City, Mo.; University Medical College of Kansas City, Mo., 1899; died January 23, aged 66.

Hyman Yudin, Beverly, Mass.; College of Physicians and Surgeons, Boston, 1918; member of the Massachusetts Medical Society; died recently, aged 53.

KILLED IN ACTION

Ward Robert Vincent, Ventura, Calif.; Harvard Medical School, Boston, 1939; formerly a resident physician on the staff of the Ventura County Hospital; commissioned a lieutenant (jg), medical corps, U. S. Naval Reserve, March 7, 1942; later promoted to lieutenant; killed in the Pacific theater Nov. 20, 1943, aged 29.

Bureau of Investigation

SOME MISCELLANEOUS MEDICAL FRAUDS

A Variety of Schemes Debarred from the Mails

Fraud orders issued by the Post Office Department have frequently been the subject of extensive articles by the Bureau of Investigation in these pages of THE JOURNAL. Following are abstracts of some fraud orders not dealt with previously:

"Dr." Clarence O. R. Rodney.—For a mere 25-cent coin, this Chicagoan gave advice on how to remove a "jinx," correct an unhappy marriage, conduct love affairs, have children, make money, or cure gambling or drinking habits. When the Post Office Department investigated Rodney's operations, it learned that he was a registered alien who came to this country from British Guiana in 1933, opened his small Chicago office in June 1940 and began doing business through the mails about a year later, advertising mostly in Negro newspapers. He referred to himself as "Doctor" and "psychologist," claiming to have received the degree of "Doctor of Psychology (Ps.D.)" from "The College of Divine Metaphysics" at Indianapolis. The Post Office Department ordered him to show cause on Jan. 21, 1943, at Washington, why a fraud order should not be issued against him. At the hearing Rodney was represented by a Chicago attorney. It was charged that Rodney was conducting a fraudulent mail-order scheme, in that he represented himself as a bona fide physician, sold advice on personal problems relating to money, love, marriage, sickness and some other things, and furnished a horoscope of each remitter; that the "answers" which Rodney sent his customers were not applicable to their particular ailments or individual problems, but were merely mimeographed or carbon copies of vague and incoherent form letters used by Rodney, and that he sometimes asked for additional fees. It was shown further that Rodney offered "Scientific and Dynamic Help through the process of Telepathic and Clairvoyant Working Operations" to enable the customer to throw off "abnormalities," and also sent him a booklet entitled "The Secret of Prosperity, Success and Happiness." Rodney issued alleged psychologic "prescriptions" which, the government charged, contained some preposterous advice. Since no evidence was presented on behalf of Rodney in defense of the charges, and since he was found to be falsely representing himself as a physician and using the mails to swindle the ignorant, his business was debarred from the mails by a Post Office fraud order issued on April 23, 1943.

Lyncha A. Johnson.—This person did business from Memphis, Tenn., as "Dr. Lyncha A. Johnson, Master Herbalist and Dr. of Naturopathy." His advertising referred to his business as a "Botanic Drug Store and Herbal Health Home" where he had "Thousands of Nature's Wonderful Plants for Suffering Humanity." As a result of complaints sent by 5 of his victims, the Post Office Department investigated, and a hearing of the case was held in Washington on Jan. 28, 1943, at which Johnson was present with his counsel. A microanalyst testified for the government that one Johnson nostrum, "Formula No. 5x55," was essentially a mixture of podophyllin, belladonna, ginger, aloin and possibly cascarin, and that another, "Compound Herb Tea No. 4," contained coarsely ground herbs including equisetum plant, sassafras, buchu, uva ursi and strawberry leaves, cornsilk, marshmallow root and mallow flowers. Then there was "Compound Herb Tea Formula No. 9099," which was reported to contain juniper berries, strawberry and sage leaves, gentian root, wild yam root, caraway seeds and stone root. Other Johnson nostrums, whose compositions were not given, were "Compound Herb Tea No. 1" and "Dr. Lyncha A. Johnson F and J Compound Herb Tea." A physician connected with the Food and Drug Administration testified that neither of these mixtures would be an effective treatment for any of the diseases for which they were sold. Accordingly, a fraud order was issued against Johnson March 12, 1943. It is also worth noting that in November 1940 in a federal court in Tennessee, Lyncha A. Johnson pleaded guilty to violating the Food, Drug and Cosmetic Act in selling 5 of his nostrums under false and misleading representations, for which he was fined $1,500 and sentenced to be confined for 6 months in a jail or federal prison camp. These products were "Double Quick Liver Tablets," "Compound Herb Tea," "Blessed Herb Tea," "Herb Wash" and "St. Bernard Compound Herb Tea." Also this is presumably the person who once operated around Lake Village, Ark., under the names "Dr. L. A. J. Johnson," "Dr. George B. Williams" and "The Associated Doctors" and was twice prosecuted and fined in the courts in that vicinity for practicing medicine without a license. Around that time (1918) the Post Office Department issued its first fraud order against him for conducting a medical swindle through the mails, as reported in THE JOURNAL, August 17, 1918, page 590.

Unger-Vanderslice Vitaelixir.—One Frank J. Unger conducted a mail-order scheme from Cleveland under the names "Frank J. Unger, Et Al., Chemists," "Unger-Vanderslice, Chemists" and "Unger-Vanderslice Company," selling treatments known as "Vitaelixir Formulas" or "Course of Herb Formulas." He represented that this "course," when followed as directed, would, among other things, remove the cause of and cure arthritis, sciatica, rheumatism, lumbago, neuritis, neuralgia, heart trouble, high blood pressure and chronic gastric and intestinal disorders, regardless of the age of the afflicted person or the duration or hopelessness of his condition, and that by its use diabetic persons using insulin could "slowly wean themselves away from the insulin." Unger's literature described his "Normal Vitaelixir Course" as a series of "herb, root and mineral formulas," to be taken for a little over six months. The treatment consisted of "5 bottles of Alpha formula, 5 bottles of Tau formula and 2 bottles of Omega formula," the whole treatment selling for $39, plus tax and mailing charges. Since Unger's various representations were obviously false, the Post Office Department summoned him to a hearing in Washington on a charge of fraud by mail. Two expert witnesses for the government testified that the Alpha formula contained emodin-bearing material, such as senna, cascara, jalap, podophyllin and ipecac, besides sulfur, epsom salt, iron, phosphorus pentoxide, calcium, and traces of organic iodine, carbonate, sodium and kelp, plus some wintergreen and sassafras; that the sludge in the bottom of the bottle consisted of sulfate, magnesium, sulfur, sassafras bark, alfalfa, senna, jalap and cascara, and that the Tau and Omega formulas contained the same ingredients as the Alpha formula, though in slightly different amounts. An expert medical witness testified for the government that the action of these preparations ranged from laxative to purgative; that the proper treatment of arthritis would depend on the particular type of the disease and the cause thereof, the physical condition of the victim, and the possible existence of complications; that Unger's nostrums would not enable persons crippled with arthritis or rheumatism to regain complete use of their limbs and get completely well, as claimed by Unger, or have any beneficial effect whatever on the course of progress of an arthritic patient's disease or symptoms, and further, that the treatments and accompanying diet "would be adverse in all severe cases of diabetes." Unger testified that when suffering from arthritis himself and taking treatment in a hospital, he had concluded that "medical science knew nothing about arthritis," and, after leaving the institution, he had applied his "knowledge of chemistry to blood and food and experimented upon himself with various foods and diets," from which he determined "that the primary foundation of my sickness was food." However, since the medical testimony in the case showed distinctly that there was no scientific basis for Unger's claims to having a cure for the various conditions named, a fraud order was issued on April 23, 1943, debarring him from further use of the mails under the various names and titles that he had used.

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

Following are abstracts of stipulations in which promoters of "patent medicines," medical devices and cosmetics have agreed, following action by the Federal Trade Commission, to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products:

Hairtone Preparations.—These include "Quinine Hairtone," "Quinine Hair Marvel," "Hairtone Scalp Formula" and "Hairtone Hair Straightener" and are put out by Matilda Richman, trading as the Hairtone Company and Hairtone Laboratories, Brooklyn, who in April 1943 stipulated with the Federal Trade Commission to discontinue the following advertising misrepresentations: That any of her products will promote the growth of hair or be an effective treatment for falling hair; that they would constitute an effective treatment or competent remedy for dandruff or are indicated for itching or sore scalp, or will result in a healthy condition of the scalp, or that they are new discoveries or vegetable compounds or herbal formulas. Further, she agreed to cease using the word "Hairtone" as a designation for her products, or representing that they impart tone to the hair or are powerful stimulants; she also was to desist from using the word "Straightener" in the name of any of her preparations, or from representing that they will straighten the hair; or using the word "Laboratories" in her trade name or in any manner which may tend to represent that she operates a laboratory. In May 1942 the Post Office Department issued a fraud order against the names Hairtone Company and Marvel Company and their officers and agents, debarring them from the use of the mails.

Krank's Hair Oil.—In April 1943 the Consolidated Royal Chemical Corporation, Chicago, and Benson & Dall, Inc., which handles its advertising, stipulated with the Federal Trade Commission that they would discontinue the following misrepresentations in the advertising of this product: That it is a cure or remedy for dandruff or valuable in the treatment of this condition in excess of the removal of dandruff scales; that it will stop falling hair or early baldness, promote the development of a good head of hair, or offer any benefit in treating irritation of the scalp in excess of affording relief from minor irritation due to the presence of dandruff scales.

Me-Ba.—That this product will relieve or cure gas pains, indigestion, heartburn or ulcers, or reach the cause of stomach disorders, were misrepresentations which the Buenger Pharmacal Company of Denver agreed to discontinue in its advertising, in a stipulation that it entered into with the Federal Trade Commission in April 1943. In this the concern further agreed to reveal that Me-Ba should not be used when abdominal pains or other symptoms of appendicitis are present, provided, however, that such advertisement need only contain the statement, "Caution: Use only as directed" if the directions in the labeling should contain a warning to the same effect.

Thomas Lecithin Capsules with Vitamin D.—Thomas C., James J. and Rosie Martindale, doing business as Thomas Martindale and Company, Philadelphia, entered into a stipulation with the Federal Trade Commission in April 1943, agreeing to cease representing that this product is of value in treating nervous exhaustion, nervous headache, nervous insomnia, or the various symptoms of nervousness, such as irritability or loss of temper; that it will increase "nerve energy" or is a "brain food," or that when used as directed, it will furnish the average minimum daily requirement of phosphorus.

Correspondence

SICKNESS, NOT HEALTH, INSURANCE

To the Editor:—The caption Sickness, Not Health, Insurance drew my attention to Dr. Haven Emerson's communication in THE JOURNAL, Nov. 27, 1943. Dr. Emerson believes that "it will add strength to our position and argument if we stick to the honest and correct term sickness insurance . . . , meaning insurance to meet the cost of sickness (institutional or medical)," avoiding wherever possible in the field of social insurance the term health insurance, which he associates with questionable political practices abroad and with the promotion of false hopes by "salesmen of New Dealism" and the "loose talk of health insurers" at home. He says further "In preparing to beat the Wagner-Murray-Dingell bill and similar legislation, we must tell the people that it compels them into sickness insurance *and is in no honest respect a measure which will contribute to health promotion or protection.*"

Now one may note Dr. Emerson's dislike of the term health insurance without sharing it. One may agree with his definition of sickness insurance as it relates to the costs of illness without wishing to see the well established and more inclusive term displaced by the less. But when one reads the uncompromising clause I have put in italics, one may well call serious attention to a clearly drawn section of the Wagner bill which Dr. Emerson emphatically neglects.

This section is entitled "Grants-in-Aid for Medical Education, Research and Prevention of Disease and Disability." It directs and authorizes the Surgeon General of the Public Health Service "to administer grants-in-aid to non-profit institutions and agencies engaging in research or in undergraduate or postgraduate professional education. Such grants-in-aid shall be made with respect to each project (1) for which application has been received . . . and (2) for which the Surgeon General finds, with the advice of the council established under section 904, that the project shows promise of making valuable contributions to the education or training of persons useful to or needed in the furnishing of medical, hospital, disability, rehabilitation and related benefits provided under this act or to human knowledge with respect to the cause, prevention, mitigation or methods of diagnosis and treatment of disease and disability."

While it is clear that the term sickness insurance as defined by Dr. Emerson is not applicable to this part of the bill, it is equally clear that the term health insurance as used in the bill itself is in entire harmony with it. This would seem to be justification for its use by the Council on Medical Service and Public Relations, to which Dr. Emerson now takes exception.

In any case it is health we all desire, physicians and laymen. To us all it is the fundamental problem, however earnestly we try to spread the burdensome costs of sickness that, unprevented, strikes. And although we commonly think of prevention as the business of public health services, local and national, we all know that a hospital day saved is one day of health earned; that incipient illnesses are commonly aborted when seen under clinical conditions; that there is such a thing as clinical prevention. Private insurance companies find it profitable to capitalize this familiar fact.

Whatever the ultimate disposition of the Wagner-Murray-Dingell bill now before the Congress, its sponsors invite our serious consideration of it as an earnest attempt to contribute constructively toward the solution of our health problem not only by providing for the costs of medical emergencies as they occur but by reducing their incidence as well. In telling the people about it, would it not be well to minimize such misunderstandings as have already emerged by permitting the bill to speak, literally, for itself?

HARRY BEAL TORREY, M.D., Berkeley, Calif.

[The letter of Dr. Torrey was referred to Dr. Emerson, who replies:]

To the Editor:—The fact that the Murray-Wagner-Dingell bill, as now presented, includes financial subsidies to institutions of learning which offer professional and vocational training in the medical and accessory occupations hardly justifies its description as an instrument of public or personal health. Neither education in the medical sciences and arts nor research in the numerous contributing sciences has lagged in the United States of America, even without the suggested grants-in-aid from the federal treasury.

In fact, it may be soundly argued that a beginning of deterioration in higher medical education and in the productiveness of medical research will occur when the administration of federal funds through such a medical dictatorship as is proposed in the bill becomes a dominant factor of their support.

The bill does not offer insurance of the people's health, even if health were insurable.

The bill is a hodgepodge, perhaps intentionally so put together, to offer some kind of service or benefit to a wide variety of people who long to get something for nothing out of fabulous Uncle Sam.

There is included compulsory sickness insurance. Provision is made for supplementary institutions for diagnosis and treatment of disease. Universities and colleges are to be helped. Research is to be aided.

And yet there is not any evidence that the measures proposed will add materially to the progress or maintenance of medicine for the sick or for protection and promotion of public health, beyond what we have grown to trust and have observed with general and proper satisfaction for the past half century, without the new, burdensome, costly and necessarily arbitrary provisions of this bill.

It is of such stuff, of such confusion of thought, with lack of evidence, proof or logical reasoning that what the social promoters call "health insurance" is compounded. Health is a popular cloak to hide a profusion of injudicious and ill conceived ideas to the effect that by more medicine, free or for a pittance, health will be achieved. Nothing is less likely.

Dr. Torrey may well promote plans for voluntary sickness insurance and encourage the support of research within the great National Institute of Health, but when he urges compulsory insurance as a means of bettering national health he is just chasing a rainbow.

HAVEN EMERSON, M.D., New York.

VOLUNTARY NONPROFIT PREPAYMENT FOR HEALTH CARE

To the Editor:—The Special Article "Voluntary Nonprofit Prepayment For Health Care" in THE JOURNAL, February 26, rates comment only in regard to "what it didn't say."

This is to be expected in all material produced by those who persist in subordinating medical problems by placing them in the genus of economic or social questions. It is the habit of those who lack medical training and experience to confuse medical service (being seen), with medical care (proper treatment).

The defect and danger in the publication of this article is the fact that it masquerades as a good, when contrasted with proposed federal imposed medical care.

What should be emphasized, and deliberately is not, in this article is the fact that the word "voluntary" contributes no virtue toward medical care: experience everywhere proves that all systems tend to become compulsory.

All prepayment systems are insurance systems, and any insurance, medical or otherwise, which collects in cash and

pays its benefits in services is essentially bad. It adulterates the quality of the product desired by the purchaser and sold as genuine.

This is not theory; this is fact, learned by all insurance men in all kinds of insurance.

There is no substitute for "Collect in Cash—Pay in Cash." This is the rule required to protect the plane of medical practice as it is today and is supported by the entire profession.

Take hospital insurance for example, where still it is tolerated, through indirect compulsions. It is a success financially and as a social project, but the actual care of the concrete sick patient has dropped to that of a generation ago. Untrained, unknown, curious novices in the glamor of being in a profession have access to and are in contact with some dangerously sick people who are not indigent but are able to pay and do think they have paid for skilled care.

This is my daily experience in hospital work and can be corroborated by the honest testimony of every house or staff doctor or even the good nurse of twenty years ago. I wonder whether it is a medical success.

FRANK J. DORAN, M.D., Cleveland.

"YAWS, LEISHMANIASIS AND PINTA"

To the Editor:—In reply to the comments of Dr. H. D. Chambers (THE JOURNAL, March 4, p. 667) on my article on "Yaws, Cutaneous Leishmaniasis and Pinta" (*ibid.*, Oct. 23, 1943), I would say:

1. My statement that the macular eruption corresponding to that of syphilis is nearly always absent in yaws was based on my own observations as well as on the writings of many men with long experience in the study of yaws. In my article on "Syphilis and Yaws: Different Diseases" (Publication No. 6, American Association for the Advancement of Science) I stated that "most authors who record their experience with yaws either fail to mention the presence of a macular rash or state definitely that it does not occur in this disease." Schüffner in 1907 stated that he had seen this rash in 4 per cent of his cases, which is the equivalent of being nearly always absent.

2. In discussing the treatment of yaws, I said that "In the early stages the disease may be permanently cured by three successive injections of neoarsphenamine." A similar statement is made by no less an authority than Col. Richard P. Strong (Stitt, E. R.: The Diagnosis, Prevention and Treatment of Tropical Diseases, Philadelphia, Blakiston Company, 1942, p. 423). Speaking of neoarsphenamine, Strong said "Frequently one dose has effected a cure when given early in the disease, but in order to prevent relapses two or three doses are advisable." He further said "In the Philippines, using 0.10 gram of neoarsphenamine per kilo weight of patient with two treatments as the rule, but occasionally including a third one, clinical cures resulted in 94.3 per cent of cases." Strong also quoted the results of Morse, who treated 1,064 cases in Santa Domingo with arsphenamine. He revisited the country five years later and found that "after treatment with three injections a cure was likely to be permanent."

3. The fact that Dr. Chambers found no further loss of cartilaginous tissue following treatment of several active lesions of gangosa cannot be considered as a cure of that disease, whose synonym is mutilating rhinopharyngitis "and whose course, even when untreated, is marked by periods of comparative quiescence" (Sutton, R. L., and Sutton, R. L., Jr.: Diseases of the Skin, ed. 10, St. Louis, C. V. Mosby, p. 1277).

4. My statement that "there is eventually complete cross immunity between syphilis and yaws . . ." is not incompatible with the acquisition of syphilis by some patients previously infected with yaws. Such cases are, however, sufficiently rare to call for publication whenever found (case of H. M. Hanschell, quoted by Dr. Chambers). The eventual development of complete cross immunity is well illustrated by the situation in the island of Guam, where no syphilis exists among the natives, practically all of whom have acquired yaws in childhood.

HOWARD FOX, M.D., New York.

BIOPSY OF THYROID IN THIOCYANATE GOITER

To the Editor:—On page 568 of the February 26 issue of THE JOURNAL Dr. E. B. Potter of Seattle makes a statement about a previous publication of mine (*New England J. Med.* **227**:594-602 [Oct. 15] 1942) to which I object on the ground that it is incorrect.

The statement in question relates to a biopsy of the thyroid in a case of thiocyanate goiter, and on it Dr. Potter makes the comment that "the microscopic report is inconclusive in this case." My statement actually was as follows (p. 597): "The biopsy showed a wildly hyperplastic thyroid." What there is "inconclusive" about this statement I am quite unable to perceive. If Dr. Potter had called it "incomplete" I would have made no protest, but to call it "inconclusive" strikes me as preposterous. Perhaps my use of the word "wildly" was revolting to a pathologist, but I cannot understand how there could have been any doubt about its meaning in the connection in which it was used.

As a matter of fact the statement that Dr. Potter cites was a preliminary one. In the *Annals of Internal Medicine* (**19**:829 [Dec.] 1943) Rawson, Hertz and Means publish a full account of this case and others with photomicrographs.

J. H. MEANS, M.D., Boston.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, April 1, page 1012.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: *Part I-II.* Various centers, May 1-3. Baltimore, April 18-20, Boston, April 4-6. New York City, April 3-5. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written.* Various large cities, May 8. *Oral.* Chicago, June 9-10. Final date for filing application is April 1. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Various centers Oct. 16. Candidates in military service may take examination at their place of duty. Final date for filing application is August 15. Asst. Sec., Dr. W. A. Werrell, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS & GYNECOLOGY. *Oral. Part II.* Pittsburgh, June 7-13. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: New York, June 2-5. Chicago, Oct. 5-7. Sec., Dr. S. Judd Beach, 704 Congress St., Portland, Me.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Oral and Written. Part I.* Chicago, New Orleans, New York and San Francisco, October. Final date for filing application is August 1. Sec., Dr. G. A. Caldwell, 3503 Prytania St., New Orleans.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral.* New York City, June 1-4. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City, Ia.

AMERICAN BOARD OF PATHOLOGY: *Oral and Written.* Chicago, June 7-8. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit.

AMERICAN BOARD OF PEDIATRICS: *Written.* Locally, Sept. 22. *Oral.* St. Louis, Nov. 8 or 9. Final date for filing application is July 8. Sec., Dr. C. A. Aldrich, 115½ First Ave. S.W., Rochester, Minn.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Venereal Diseases: Conviction of Infected Person Exposing Another by Sexual Intercourse to Venereal Disease.—An Oklahoma statute makes it a felony for any person after becoming infected with venereal disease and before being discharged and pronounced cured by a physician to marry or expose any other person to such disease by sexual intercourse. An information was filed against the petitioner charging that on a stated day she, being infected with a venereal disease, committed the crime of exposing a stated person to a venereal disease by having sexual intercourse with him. She plead guilty and was sentenced to the state penitentiary. Later a habeas corpus proceeding was instituted in the criminal court of appeals of Oklahoma, alleging that the information in question was fatally defective and was insufficient to confer jurisdiction on the trial court because it failed to negative the fact that she had been "discharged and pronounced cured by a reputable physician in writing," which, so it was alleged, the statute specifically makes an element of the offense.

In *Epps* v. *State*, 69 Okl. Cr. 460, 104 P. (2d) 262, said the criminal court of appeals of Oklahoma, this court sustained an information under the identical statute on which this information is based. The information in that case was similar in language to the information here in dispute. It was alleged in the information involved in the Epps case:

> That the said M. T. Epps did then and there knowingly, wrongfully and unlawfully and feloniously, by the act of copulation, communicate to the said Ruth Epps, a venereal disease, to-wit: syphilis, contrary to the form of the statutes in such cases made and provided and against the peace and dignity of the State.

Although the specific question now raised as to the necessity of the information's of negativing the fact that the accused had not been cured was not considered in disposing of the Epps case, we did hold in affirming that judgment that there were no fundamental defects in the information or the proceedings before the trial court which would deprive the court of jurisdiction to sentence the accused. There are many decisions of this court wherein we have held that exceptions in a statute similar to the exception herein, which provides for a written release from a reputable physician, are a defense to be pleaded by the defendant. It is fundamental that it is not necessary in an information to allege any fact which it is not necessary for the state to prove to secure a conviction. Under the statute here involved, if we should hold that the state had the burden of proving that the accused had not been discharged and pronounced cured by a reputable physician in writing, it would create an almost insurmountable burden on the state. The state would not be in possession of the intelligence as to who had been administering treatment to the accused or whether she had even been given treatment for her venereal disease. The prosecution surely would not be required to bring all of the physicians in the community to court to inquire whether they had discharged the patient as cured. To this court it is apparent that this provision was inserted in the statute by the legislature as a matter of defense which may be interposed by an accused, and when such defense is made it then should be submitted to a jury for their determination as to whether the accused had been discharged as cured by a reputable physician in writing and had innocently exposed another person to a venereal disease under the honest belief that she was no longer infected. The state has the burden of proving beyond a reasonable doubt that the accused had become infected with a venereal disease and that subsequently thereto she had exposed another person to such disease by some of the means set forth in the statute.

The court accordingly held that the information filed against the petitioner in the trial court was sufficient to allege a violation of the act and that the commitment of the petitioner of a plea of guilty to that information was sufficient authority for her confinement in the penitentiary. A writ for habeas corpus was accordingly denied.—*Ex parte Brown, 139 P. (2d) 196 (Okla., 1943).*

Society Proceedings

COMING MEETINGS

Alabama, Medical Association of the State of, Montgomery, April 18-20. Dr. D. L. Cannon, 519 Dexter Avenue, Montgomery, Secretary.

American Association for Thoracic Surgery, Chicago, May 5-6. Dr. Richard H. Meade Jr., Kennedy General Hospital, Memphis, 15, Tenn., Secretary.

American Association of Industrial Physicians and Surgeons, St. Louis, May 8-11. Dr. Edward C. Holmblad, 28 East Jackson Blvd., Chicago, Managing Director.

American Association of Plastic Surgeons, Philadelphia, May 25-27. Dr. Frederick A. Figi, 102 Second Ave., S.W., Rochester, Minn., Secretary.

American Association on Mental Deficiency, Philadelphia, May 11-15. Dr. Neil A. Dayton, Mansfield Training School, Mansfield Depot, Connecticut, Secretary.

American Neurological Association, New York, May 19-20. Dr. Henry Alsop Riley, 117 E. 72d St., New York 21, Secretary.

American Ophthalmological Society, Hot Springs, Va., May 29-31. Dr. Walter S. Atkinson, 129 Clinton St., Watertown, N. Y., Secretary.

American Psychiatric Association, Philadelphia, May 15-18. Dr. Winfred Overholser, St. Elizabeth's Hospital, Washington, D. C., Secretary.

American Psychoanalytic Association, Philadelphia, May 13-15. Dr. Robert P. Knight, 3617 W. Sixth Ave., Topeka, Kansas, Secretary.

American Society for Clinical Investigation, Atlantic City, May 8. Dr. Wesley W. Spink, University Hospitals, Minneapolis, Secretary.

Arizona State Medical Association, Phoenix, April 14-15. Dr. Frank J. Milloy, 112 N. Central Ave., Phoenix, Secretary.

Arkansas Medical Society, Little Rock, April 17-18. Dr. W. R. Brookseher, 602 Garrison Avenue, Fort Smith, Secretary.

Association of American Physicians, Atlantic City, May 9. Dr. Joseph T. Wearn, Lakeside Hospital, Cleveland, Secretary.

California Medical Association, Los Angeles, May 7-8. Dr. George H. Kress, 450 Sutter Street, San Francisco 8, Secretary.

Connecticut State Medical Society, Bridgeport, May 2-4. Dr. Creighton Barker, 258 Church St., New Haven, Secretary.

Florida Medical Association, St. Petersburg, April 13-14. Dr. Shaler Richardson, 111 West Adams St., Jacksonville, Secretary.

Georgia, Medical Association of, Savannah, May 9-12. Dr. Edgar D. Shanks, 478 Peachtree St. N.E., Atlanta, Secretary.

Illinois State Medical Society, Chicago, May 16-18. Dr. Harold M. Camp, 224 S. Main St., Monmouth, Secretary.

Iowa State Medical Society, Des Moines, April 20-21. Dr. Robert L. Parker, 3510 Sixth Avenue, Des Moines, Secretary.

Kansas Medical Society, Topeka, May 10-11. Dr. F. R. Croson, 112 West Sixth Street, Topeka, Secretary.

Louisiana State Medical Society, New Orleans, April 24-26. Dr. P. T. Talbot, 1430 Tulane Ave., New Orleans, 13, Secretary.

Maryland, Medical and Chirurgical Faculty of, Baltimore, April 25-26. Dr. W. Houston Toulson, 1211 Cathedral St., Baltimore, Secretary.

Massachusetts Medical Society, Boston, May 23-24. Dr. Michael A. Tighe, 8 Fenway, Boston 15, Secretary.

Minnesota State Medical Association, Rochester, April 13-15. Dr. B. B. Souster, 493 Lowry Medical Arts Bldg., St. Paul, Secretary.

Mississippi State Medical Association, Jackson, May 9-10. Dr. T. M. Dye, Box 295, Clarksdale, Secretary.

Missouri State Medical Association, Kansas City, April 23-25. Dr. Ralph L. Thompson, 634 N. Grand Blvd., St. Louis, Secretary.

National Tuberculosis Association, Chicago, May 10-12. Dr. Charles J. Hatfield, 1790 Broadway, New York, Secretary.

Nebraska State Medical Association, Omaha, May 1-4. Dr. R. B. Adams, 416 Federal Securities Bldg., Lincoln, Secretary.

New Hampshire Medical Society, Manchester, May 16. Dr. C. R. Metcalf, 5 S. State St., Concord, Secretary.

New Jersey, Medical Society of, Atlantic City, April 25-27. Dr. Alfred Stahl, 55 Lincoln Park, Newark, Secretary.

New York, Medical Society of the State of, New York, May 8-11. Dr. Peter Irving, 292 Madison Ave., New York 17, Secretary.

North Carolina, Medical Society of the State of, Pinehurst, May 1-3. Dr. R. D. McMillan, P. O. Box 232, Red Springs, Secretary.

North Dakota State Medical Association, Fargo, May 7-9. Dr. L. W. Larson, 221 5th Street, Bismarck, Secretary.

Northern Tri-State Medical Association, Toledo, Ohio, April 11. Dr. Oscar P. Klotz, 127 W. Hardin St., Findlay, Ohio, Secretary.

Ohio State Medical Association, Columbus, May 2-4. Mr. Charles S. Nelson, 79 E. State St., Columbus, Executive Secretary.

Oklahoma State Medical Association, Tulsa, April 24-26. Dr. L. J. Moorman, 1200 N. Walker St., Oklahoma City, Secretary.

Rhode Island Medical Society, Providence, May 24-25. Dr. William P. Buffum, 122 Waterman St., Providence 3, Secretary.

Society of American Bacteriologists, New York, May 3-5. Dr. W. C. Frazier, 310 Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.

South Carolina Medical Association, Columbia, April 11-12. Dr. Julian P. Price, 105 W. Cheves St., Florence, Secretary.

South Dakota State Medical Association, Huron, May 21-23. Dr. Roland G. Mayer, 22½ S. Main St., Aberdeen, Secretary.

Tennessee State Medical Association, Nashville, April 11-13. Dr. H. H. Shoulders, 706 Church St., Nashville, Secretary.

Texas, State Medical Association of, Dallas, May 10-11. Dr. Holman Taylor, 1404 W. El Paso Street, Fort Worth, Secretary.

West Virginia Medical Association, Wheeling, May 15-16. Mr. Charles Lively, P. O. Box 1031, Charleston, Executive Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Obstetrics and Gynecology, St. Louis

47:1-148 (Jan.) 1944

*Harmful Influence of Pregnancy on Advanced Tuberculosis as Modified by Collapse Therapy. J. W. Cutler.—p. 1.
*Constitutional Type of Female Precocious Puberty, with Report of 9 Cases. E. Novak.—p. 20.
Adrenal-like Ovarian Tumor Associated with Cushing's Syndrome (So-Called Masculino-Voblastoma, Luteoma, Hypernephroma, Adrenal Cortical Carcinoma of Ovary). E. J. Kepler, M. B. Dockerty and J. T. Priestley.—p. 43.
Adrenal Rest Tumor of Ovary. H. J. Greene and W. A. Lapp.—p. 63.
Intravenous Amino Acids in Nephrotic Toxemia of Pregnancy. J. E. Corr, W. Wagner and M. Hetzer.—p. 70.
Comparative Value of Endometrial Biopsies and Vaginal Smears. T. Neustaedter and L. L. Mackenzie.—p. 81.
Demerol (S-140) and Scopolamine in Labor. W. R. Schumann.—p. 93.
Continuous Caudal Anesthesia in 200 Obstetric Patients. H. Lyons and F. M. Hunsen Jr.—p. 105.
Findings in Routine Pelvic Examinations on 1,998 Women. E. L. Carey and Cornelia J. Gaskill.—p. 111.
Combined Extrauterine and Intrauterine Pregnancy. W. E. Studdiford and G. Speck.—p. 118.
Results of Surgical Castration in Women Under Forty. W. Filler and N. Drezner.—p. 122.
Treatment with Penicillin After Failure of Sulfa Drugs in Case of Vaginal Plastic Followed by Blood Stream Infection. A. M. Hellman and E. F. Guilfoil.—p. 125.
Abdominal Pregnancy Requiring Secondary Removal of Placenta. J. W. Pearson Jr. and J. Parks.—p. 127.

Harmful Influence of Pregnancy on Advanced Tuberculosis.—Cutler reviews the immediate and late effects of pregnancy on advanced tuberculosis in 26 white women who were treated with collapse therapy to control the tuberculosis before giving birth to one or more children. These women have been under constant clinical and roentgenologic observation for various periods of time during the past fifteen years. The average for the group was nine years. These 26 women had forty-eight pregnancies following collapse therapy and gave birth to 40 children, of whom 36 are alive and well. Pregnancy can and does affect some patients with tuberculosis unfavorably. Exacerbation may occur either in the early months of pregnancy or within the first few months following delivery. Collapse therapy has minimized this risk. If the diseased area is well collapsed, the sputum free of bacilli and the collapse maintained throughout pregnancy there is little or no risk of reactivating the process. Such women may safely undertake one or more pregnancies. If there is disease in both lungs and only the "worse" lung is treated with localized collapse therapy, the disease in the uncollapsed lung, although quiescent before pregnancy, may become active in approximately 30 per cent of the cases. In about half of this number collapse therapy may actually be essential to control the reactivated disease in the untreated lung. The possibility of reactivating quiescent tuberculosis in an uncollapsed lung is not in itself a contraindication to pregnancy. Permission may be given as long as the patient is kept under observation and is willing to accept collapse therapy when it becomes necessary. Pneumothorax therapy may be considered as an alternative to therapeutic abortion in the presence of active tuberculosis first recognized during the early months of pregnancy. Only collapse therapy which produces adequate localized collapse of the diseased portion of the lung, such as pneumothorax, maintainance oleothorax or thoracoplasty, will prevent reactivation of the disease. Indirect collapse, such as phrenic nerve interruption, is not enough. Inadequate collapse therapy may be considered the same as no collapse therapy as far as the effect of pregnancy on tuberculosis is concerned. The majority of such patients with advanced disease do poorly, and pregnancy is inadvisable.

Constitutional Type of Female Precocious Puberty.—Novak reports 9 instances of precocious puberty in girls aged 15 months, 2 years, 2 years 8 months, 4 years, 4½ years, 6½ years, 7 years, 7 years and 7½ years. As to why an otherwise normal puberal mechanism is awakened at an abnormally early age no explanation seems plausible except on a chromosomal or genic basis, so that the designation of "constitutional" seems appropriate for this group. Cases of this type are far more common than those due to granulosa cell tumors, which gynecologists especially are apt to think of first in association with precocious puberty, often resorting to exploratory laparotomy in such cases. Biopsies in several instances has convinced the author that, unlike girls with granulosa cell tumor, those of constitutional type may not only menstruate but also ovulate at abnormally early ages. This would explain the occurrence of pregnancy at extremely early ages, as in the remarkable case reported from Lima, Peru, in 1940 of a full term pregnancy in a child 5 years and 8 months old. The most important practical points in the management of these cases are the physiologic management to avoid the development in the child's mind of self consciousness or a sense of inferiority or abnormality and protection against the possibility of insemination.

American Review of Soviet Medicine, New York

1:101-192 (Dec.) 1943

Antireticular Cytotoxic Serum as Means of Pathogenetic Therapy. A. A. Bogomolets.—p. 101.
Method of Preparing and Preserving Antireticular Cytotoxic Serum. P. D. Marchuk.—p. 113.
Antireticular Cytotoxic Serotherapy of Frostbite and War Wounds. B. E. Linberg.—p. 124.
Digestion and Metabolism in High Altitude Flights. V. V. Streltsov. —p. 130.
Altitude Sickness in Fliers. P. F. Vokhmianin.—p. 140.
Wound Phthisis. A. V. Rusakov.—p. 145.

Annals of Internal Medicine, Lancaster, Pa.

20:1-192 (Jan.) 1944

Vitamin Status of Population of West Coast of Newfoundland, with Emphasis on Vitamin C. Ellen McDevitt, Margaret A. Dove, R. F. Dove and I. S. Wright.—p. 1.
*Meningococcic Infections: Report of 43 Cases of Meningococcic Meningitis and 2 Cases of Meningococcemia. H. W. Smith, L. Thomas, J. H. Dingle and M. Finland.—p. 12.
*Some Clinical Aspects of Meningococcic Infection. F. D. Adams.—p. 33.
*Analysis of Epidemic of Dengue Fever. P. Kisner and E. T. Lisansky. —p. 41.
Further Studies of Platelet Reducing Substances in Splenic Extracts. E. P. Cronkite.—p. 52.
Osteonephropathy: Clinical Consideration of "Renal Rickets." C. Rule and A. Grollman.—p. 63.
Carcinoma and Leukemia: Report of 2 Cases with Combined Lesions: Review of Literature. M. Morrison, F. Feldman and A. A. Samwick. —p. 75.
Renal Lesion in Rheumatic Fever. R. L. Hutton and C. R. Brown. —p. 85.
Ultimate Effect of Pregnancy on Rheumatic Heart Disease. N. H. Boyer and A. S. Nadas.—p. 99.
Studies in Acute Myocardial Infarction: I. Clinical Picture and Diagnosis. S. Baer and H. Frankel.—p. 108.
Studies in Acute Myocardial Infarction: II. Laboratory Procedures as Diagnostic Aids. S. Baer and H. Frankel.—p. 115.
*Treatment of Hypertension: Comparison of Mortality in Medically and Surgically Treated Cases. N. Flaxman.—p. 120.

Meningococcic Infections.—Smith and his collaborators review 51 meningococcic infections among patients admitted to the Boston City Hospital in the two year period beginning Sept. 1, 1940. Included among these were 43 with meningitis and 8 with meningococcemia without clinical evidence of meningitis. There were 9 deaths among the former and none among the latter. Any one or more of the characteristic findings of meningococcic meningitis may be absent in any given patient. A tentative diagnosis of meningococcic meningitis can be made in almost every instance by examination of a gram stained smear of the cerebrospinal fluid or its sediment. Group II meningococcus should be carefully distinguished from the gonococcus, especially when the organism is recovered only from the blood. All except 2 of the patients with meningitis who recovered showed objective signs of clinical improvement twenty-four hours or less after chemotherapy. The initial dose of a sulfonamide should be administered intravenously even if patients appear only moderately ill when first seen. Patients with a

relative bradycardia, even though they appear only moderately ill on admission, should be observed closely for evidence of increased intracranial pressure. Lumbar puncture still has a place in the therapy of meningococcic meningitis for diagnosis and for the relief of symptoms of increased intracranial pressure. Normal cerebrospinal fluid sugar values obtained after the use of sulfonamides or of parenteral dextrose therapy are of no value by themselves in estimating the progress of the disease. Pulmonary involvement is quite frequent in the course of meningococcic meningitis. It probably represents a local infection by the meningococcus either alone or with other organisms. Pneumonia due to the meningococcus may occur in the absence of meningitis, but such cases were not recognized in the present series.

Clinical Aspects of Meningococcic Infection.—Adams states that as the result of experience gained in army hospitals his conception of meningococcic infection has been appreciably altered. Meningococcic disease should be regarded as a blood stream infection of which cerebrospinal meningitis is but one manifestation. Cases without meningitis are common. When the disease exists in a community every person with upper respiratory symptoms should be regarded with suspicion and closely watched. The usual forms in which meningococcic disease may appear are: (*a*) Meningococcemia with acute meningitis. Diagnosis can and should be made before the appearance of signs of meningitis. Especially in the presence of upper respiratory symptoms, severe headache, apathy, restlessness or delirium, muscle aches, slight stiffness of the neck or an eruption which is not characteristic of the common exanthemas are indications for diagnostic lumbar puncture. (*b*) Acute fulminating septicemia with or without meningitis, manifested by sudden onset with prostration, rapidly developing profuse macular and petechial eruption, early and rapid circulatory collapse followed by death, often within a matter of hours. (*c*) A less severe form of bacteremia characterized by inflammation of one or more joints, a less intense eruption, often macular rather than petechial, and aching in the muscles of the extremities. (*d*) A chronic form of bacteremia in which bouts of fever accompanied by joint pains and mild eruption occur at intervals of weeks or months with intervening periods of relatively good health. In any of these last three groups the clinical picture of meningitis may develop, but the diagnosis can and must be made in the absence of symptoms of meningeal involvement. Early treatment with a sulfonamide drug is almost certain to effect a cure except in cases of acute fulminating septicemia and in meningitic cases in which treatment is started late. The first dose should be given intravenously. Fluid intake must be high. Antimeningococcus antitoxin should be tried on all severely ill patients. Adrenal cortex extract may counteract the circulatory collapse associated with the fulminating septicemia.

Epidemic of Dengue Fever.—Kisner and Lisansky state that approximately 1,200 cases of dengue fever occurred in army personnel in and around a coastal town on an island in the South Pacific from March 1, 1943 to April 30, 1943. Six hundred and twenty-two were hospitalized and 318 cases of this group were analyzed as to symptoms, physical aspects and laboratory data. The island harbored numerous endemic cases of dengue fever among the civilian population, a large number of newly arrived nonimmune army personnel and the most efficient mosquito vector, Aedes aegypti. Cases which occurred early in the epidemic were more atypical than the subsequent ones and caused some difficulty in diagnosis. The onset was sudden in about 93 per cent after an incubation period of six to ten days. Aches and pains in one or more sites occurred in 99 per cent. The frontal headache, backache and generalized aches and pains were common complaints. Feverishness and chilliness were frequent and early symptoms. Weakness, abdominal pain and insomnia occurred next in order of frequency. Dizziness, nausea, burning of the eyes, photophobia and distortion of taste were complained of in a small number of cases. Diarrhea, itching of the skin, sore throat, vomiting, constipation, numbness and tingling of the extremities and epistaxis were last in order of frequency. The temperature curve was saddle-back in about 66 per cent of cases. A relative bradycardia was found after the second day of illness in 97 per cent. A rash was present in 37 per cent of all cases. A diffuse flushing of the skin, primarily of the face and chest, was seen in about one fourth. About the same number showed reddening of the conjunctiva. Adenopathy, pharyngeal vascular congestion, hyperesthesia or cyanosis of the fingers and toes were found in a small number. Laboratory examination revealed leukopenia and a Schilling shift to the left. Abnormal lymphocytes with a vacuolated cytoplasm and coarse granular inclusions was a rather constant finding. The convalescence was moderately prolonged. All cases responded to symptomatic therapy and there were no complications.

Mortality in Hypertension.—Flaxman compared the mortality statistics of 350 hypertensive patients treated surgically by Peet and his co-workers with the mortality of 244 hypertensive patients observed by himself and treated only medically. He found little difference between the two groups. He concludes that it is doubtful whether so-called specific surgery alters the course and prognosis in cases of hypertension, including those with malignant hypertension.

Archives of Neurology and Psychiatry, Chicago

51:1-112 (Jan.) 1944

Paralysis of Nerve Induced by Direct Pressure and by Tourniquet. D. Denny-Brown and C. Brenner.—p. 1.

Atrophy of Basal Ganglia in Pick's Disease: Clinicopathologic Study. A. J. Akelaitis.—p. 27.

Agenesis of Corpus Callosum with Possible Porencephaly: Review of Literature and Report of Case. A. T. Bunts and J. S. Chaffee.—p. 35.

Protective Barriers of Central Nervous System: Experimental Study with Trypan Red. R. B. Aird and L. Strait.—p. 54.

Cerebellar Syndrome Following Heat Stroke. W. Freeman and Edith Dumoff.—p. 67.

Cerebral Arteriovenous Oxyen Difference: II. Mental Deficiency. H. E. Himwich and J. F. Fazekas.—p. 73.

Cerebral Cortex of Man with Senile Dementia Believed to Be 107 Years Old. W. Riese and I. S. Zfass.—p. 78.

Archives of Ophthalmology, Chicago

31:1-128 (Jan.) 1944

Penetration of Penicillin into Eye. L. von Sallmann and K. Meyer, with technical assistance of Jeanette Di Grandi.—p. 1.

Pathologic Changes in Lens Associated with Nontraumatic Iritis. B. Samuels.—p. 8.

Socket After Enucleation and Artificial Eye. T. J. Dimitry.—p. 18.

Effect of Local Anesthetics on Regeneration of Corneal Epithelium. T. Gundersen and S. D. Liebman.—p. 29.

Binocular Refraction with Cross Cylinder Technic. H. S. Sugar.—p. 34.

Problem of Split Macula: Study of Visual Fields. J. N. Evans and F. Browder.—p. 43.

*Penicillin and Sulfadiazine in Treatment of Experimental Intraocular Infections with Staphylococcus Aureus and Clostridium Welchi. L. von Sallmann.—p. 54.

Keratitis Occurring with Molluscum Contagiosum. O. S. Lee Jr.—p. 64.

Tuberous Sclerosis: Report of Case. E. F. Krug, with assistance of F. A. Echlin.—p. 68.

Pupillographic Studies: V. Periodic Sympathetic Spasm and Relaxation and Role of Sympathetic Nervous System in Pupillary Innervation. O. Lowenstein and A. S. Levine.—p. 74.

Diabetic Retinopathy. I. H. Leopold.—p. 96.

Penicillin and Sulfadiazine in Intraocular Infections.—Von Sallmann injected various strains of Staphylococcus aureus into the anterior chamber of the eyes of chinchilla rabbits with simultaneous injury of the lens to produce a reliable standard lesion for chemotherapeutic experiments. Combined oral and topical use of sulfadiazine was beneficial in 21.7 per cent of the eyes with purulent endophthalmitis thus produced when the treatment was initiated six to seven hours after inoculation. Penicillin applied topically with the first treatment six to seven hours after inoculation controlled the infection definitely in 62.5 per cent and possibly in 75 per cent of the eyes. Intralenticular injections with Clostridium welchi caused destructive endophthalmitis. Neither sulfadiazine nor penicillin therapy begun six hours after the intralenticular injection of Cl. welchi had any effect on the resulting endophthalmitis.

Arkansas Medical Society Journal, Fort Smith

40:139-154 (Jan.) 1944

Promotion of Friendships Among Physicians. L. H. McDaniel.—p. 139.

40:155-170 (Feb.) 1944

Diagnosis and Treatment of Hyperthyroidism. M. M. Even.—p. 155.

Endocrinology, Springfield, Ill.

34:1-76 (Jan.) 1944. **Partial Index**

Study of Crop Sac Weight Method for Prolactin Assay. S. R. Hall. —p. 1.
Fluorescent and Histochemical Reactions in Rat Thyroid Gland at Different States of Physiologic Activity. E. W. Dempsey.—p. 27.
Differential Concentration of Hormones in Central and Peripheral Zones of Bovine Anterior Pituitary Gland. G. K. Smelser.—p. 39.
Mode of Action of Thiourea on Thyroid Gland of Rabbits. E. J. Baumann, Nannette Metzger and D. Marine.—p. 44.
Quantitative Study of Effects of Estradiol Benzoate and Progesterone in Modifying Incidence of Binucleated Cells in Rabbit Liver. J. C. Allan.—p. 50.
Homoioplastic Adrenal Grafts to Cerebral Cortex of Rat. C. M. Pomerat, C. G. Breckenridge and L. Gordon.—p. 60.
Cretinism in Rats Induced by Thiouracil. A. M. Hughes.—p. 69.

Gastroenterology, Baltimore

1:1085-1174 (Dec.) 1943

*Duodenal Diverticula, with Special Reference to Their Symptomatology. H. A. Warren and E. S. Emery Jr.—p. 1085.
*Lymphosarcoma of Intestines: 15 Cases; Characteristic Sigmoidoscopic Picture. A. Winkelstein and M. H. Levy.—p. 1093.
*Pulmonary and Intestinal Changes in Strongyloidiasis. J. E. Berk, M. T. Woodruff and A. W. Frediani.—p. 1100.
Tetrachlorethane Intoxication: Early Recognition of Liver Damage and Means of Prevention. R. Gurney.—p. 1112.
Mixed Effects of Olive Oil in Clinical Doses on Gastric Function. F. L. Apperly.—p. 1127.
Effect of Anemia on Gastric Emptying. L. O. Jacobson and W. L. Palmer.—p. 1133.

Symptomatology of Duodenal Diverticula.—Warren and Emery studied 103 cases of diverticulum of the duodenum found in the records of the Peter Bent Brigham Hospital from 1914 to 1941. The study did not reveal any typical symptomatology. The diverticula found in the first portion of the duodenum are usually of the false type and appear to be associated in most instances with duodenal ulceration. Those in the second portion are usually a true herniation of the mucosa through the muscular wall. A fair number of these show inclusions of pancreatic tissue. Four of the cases showed evidence of inflammation within the sac, and 1 a localized abscess. The finding of a diverticulum in the first portion of the duodenum usually means the presence of peptic ulceration. One is justified in treating such persons as if they had a duodenal ulcer. A sac which fails to empty satisfactorily will give symptoms. A sac which does not retain the barium is less likely to be a source of trouble than one which shows a retention. Smaller pockets are less likely to be of clinical importance than the larger ones.

Lymphosarcomas of Intestine.—According to Winkelstein and Levy, lymphosarcoma of the intestine is a rare disease of unknown causation. The small intestine is more often involved than the large intestine. Multiple intestinal lesions are not uncommon. Lymphosarcoma may occur at any age. The authors present a summary of 15 cases observed at the Mount Sinai Hospital from 1932 to 1942. Eleven of the patients were men. There were no children. Nine patients were between the ages of 29 and 41 and 6 patients were between 52 and 65. The lesion of 9 patients was resected, of whom 4 died immediately after the operation. All the patients who survived the operation were subjected to radiotherapy. Two of the 3 other patients being given surgical treatment underwent exploration only, and in the third the lesion was merely sidetracked. This patient survived four years. Of the 2 undergoing exploration 1 died immediately and the other was lost sight of. Of the 3 patients not surgically treated 1 survived eighteen months with radiotherapy; 1 lived for four and one-half years without treatment and then survived another eighteen months with radiotherapy; the third patient died without treatment in three months. The histologic differentiation into small cell lymphosarcoma and reticulum cell sarcoma is unimportant clinically. Abdominal pain, loss of weight, pallor and abdominal mass or masses are the chief symptoms. There is frequently a characteristic sigmoidoscopic picture which resembles the convoluted surface of the brain. Sooner or later intestinal lymphosarcoma becomes a systemic disease. It is invariably fatal. With surgical removal plus radiotherapy the duration of life is usually less than one year. Occasionally patients live several years.

Pulmonary and Intestinal Changes in Strongyloidiasis.—Berk and his associates call attention to the fact that, although strongyloidiasis is primarily a disease of the warm climates and ordinarily rarely encountered in the temperate zones, the migration of persons from the southern part of the United States to the industrial war centers of the North and East and the return home of men who have completed military service in tropical climes will probably bring about a wide dispersal of the disease. The authors describe the life cycle of Strongyloides stercoralis and the pathologic physiology and clinical aspects of strongyloidiasis. They encountered 2 cases of strongloidiasis in the past year in both of which pulmonary symptoms had appeared prior to their coming under observation. They emphasize that sputum and stools should be examined for evidence of Strongyloides stercoralis in any case with respiratory symptoms of obscure etiology, especially if there is an eosinophilia and x-ray evidence of transient pulmonary infiltrations. Pulmonary changes due to intestinal parasites should be suspected whenever dyspnea, cough or hemoptysis occurs in an individual who also complains of abdominal pain, diarrhea or other digestive tract difficulties. Granulomatous tumor-like masses may develop in those sections of the intestine heavily parasitized by Strongyloides stercoralis. Enteritis is a feature of strongyloidiasis, and abnormalities in the x-ray appearance of the small intestine may be found in patients with this disease.

Indiana State Medical Assn. Journal, Indianapolis

37:57-108 (Feb.) 1944

Sulfonamide Therapy in Brucellosis: Review of Literature. D. L. Urschel.—p. 57.
Venereal Disease Epidemic in Rural Community. L. D. Eaton.—p. 60.
Encephalopathy Following Massive Arsenotherapy. G. W. Bowman and F. G. Sheehan.—p. 66.
Diagnosis of Acute Appendicitis. M. B. Welborn.—p. 68.
Chronic Fatigue. G. E. Metcalfe.—p. 70.
Neuroses Incident to War Strain—Their Effect on Civilian Population. L. D. Carter.—p. 72.

Journal of Allergy, St. Louis

15:1-76 (Jan.) 1944

Canine Sensitivity to Ascaris Antigen. M. Brunner, I. Altman and Katherine Bowman.—p. 2.
Absorption of Whole Ragweed Pollen from Gastrointestinal Tract. R. Hecht, M. M. Mosko, J. Lubin, M. B. Sulzberger and R. L. Baer.—p. 9.
Experimental Use of Ethylene Disulfonate (Allergosil Brand) in Prevention of Anaphylaxis in Guinea Pigs. R. T. Fisk, W. S. Small and A. G. Foord.—p. 14.
Failure of Vitamin E in Treatment of Ragweed Pollinosis (Hay Fever). J. Glaser and H. Dam.—p. 18.
Potential Pollinosis in Desert and Coastal City: Comparative Botanic Survey of Barstow and Santa Ana, California. R. W. Lamson, H. McMichael and M. Stickler.—p. 21.

Journal-Lancet, Minneapolis

64:1-34 (Jan.) 1944

*Hemorrhagic Disease of Newborn: Prevention and Treatment with Vitamin K. L. G. Pray.—p. 1.
Continuous Caudal Anesthesia in Obstetrics. L. M. Randall.—p. 7.
Laboratory of Physician and Small Hospital. W. A. Wright.—p. 12.
Gastric Resection in Treatment of Gastrojejunocolic Fistula: Report of 3 Cases. H. M. Blegen Jr. and A. Ferret.—p. 17.
Advances in Treatment of Hypertension. O. A. Sedlak.—p. 22.
Comparative Study of Ultraviolet Irradiated Ergosterol (Steenbock Process) and Electrically Activated Ergosterol (Whittier Process): Preliminary Report. R. Garfield Snyder, W. H. Squires, J. W. Forster and E. Rudd.—p. 25.
Student Health Rates, University of Michigan. W. E. Forsythe.—p. 27.

Vitamin K in Hemorrhagic Disease of the Newborn.—Pray reports the prophylactic effect on hemorrhagic diathesis in the newborn of antepartum administration of menadione to mothers. Some observations on treatment have also been made. The expectant mothers were divided into three categories. One group received menadione before delivery for periods varying from three days to six weeks; a second group was treated during labor; a third was given no medicinal vitamin K. A preparation of menadione in tablet form was used. The author utilized a simple test requiring only 0.1 cc. or less of capillary blood in making multiple determinations of prothrombin values in newborn infants. The results obtained confirm the observations of other investigators that the administration of vitamin K to expectant mothers, either during the latter part of pregnancy

or during labor, results in approximately normal prothrombin values in their infants and virtually eliminates the prolongation in prothrombin time, which usually occurs in untreated cases between the second and fourth days of life. Menadione is one of the most potent preparations having vitamin K activity. The incidence of retinal hemorrhages in the newborn was greatly reduced in infants of mothers treated with menadione during labor or prior to labor. The results suggest that the reduction is greatest in the cases in which treatment is instituted before the onset of labor. These findings are of particular interest in their possible relationship to intracranial hemorrhage. The introduction of formula feedings during the first few days of life counteracted hypoprothrombinemia. Three infants with hemorrhagic disease of the newborn were rapidly cured by administration of vitamin K. In 2 cases this was administered intramuscularly, and in 1 case by mouth. It is considered advisable to administer vitamin K to all mothers either during early labor or daily during the last few weeks of pregnancy. In case this is not possible, vitamin K should be given to the infant during the first twelve hours of life either by mouth or parenterally. If none of these courses are feasible, supplemental formula feedings given the baby during the first two or three days will raise the prothrombin level effectively. Treatment of hemorrhagic disease itself should consist in prompt administration of vitamin K, preferably by a parenteral route.

Journal of Nervous and Mental Disease, New York

99:1-114 (Jan.) 1944

Neuropathologic and Psychopathologic Implications of Bilateral Prefrontal Lobotomy. G. W. Kisker.—p. 1.
Human Pyramidal Tract: VII. Critical Review of Its Origin. A. M. Lassek.—p. 22.
Constitutional Analysis: Case Study. F. A. Freyhan.—p. 29.
An Unusual Familial Syndrome. A. P. Friedman and J. E. Roy.—p. 42.
Traumatic Psychosis: Questionable Disease Entity. N. Moros.—p. 45.
Studies in Subconvulsive Electric Shock Therapy Effect of Varied Electrode Applications. B. H. Gottesfeld, S. M. Lesse and H. Herskovitz.—p. 56.
Homosexuality: Biologic Anomaly. E. G. Williams.—p. 65.
Note on First Demonstration of Intracranial Foreign Body by Roentgen Rays. C. Pilcher.—p. 71.

Journal of Neurophysiology, Springfield, Ill.

7:1-80 (Jan.) 1944

Oscillographic Study of Olfactory System of Cats. C. A. Fox, W. A. McKinley and H. W. Magoun.—p. 1.
Effect of Calcium on Neuromuscular Junction. S. W. Kuffler.—p. 17.
Effects of Dorsal Root Section on Cholinesterase Concentration in Spinal Cord of Cats. D. Nachmansohn and E. C. Hoff.—p. 27.
Functional Organization of Frontal Pole in Monkey and Chimpanzee. Margaret A. Kennard and W. S. McCulloch.—p. 37.
Distribution of Acetylcholine in Brains of Rats of Different Ages. J. H. Welsh and Jane E. Hyde.—p. 41.
Functional Organization of Medial Aspect of Primate Cortex. P. Bailey, G. von Bonin, E. W. Davis, H. W. Garol, W. S. McCulloch, E. Roseman and A. Silveira.—p. 51.
Optic Nerve Regeneration with Return of Vision in Anurans. R. W. Sperry.—p. 57.
Peripheral Unit for Pain. G. H. Bishop.—p. 71.

Medical Annals of District of Columbia, Washington,

13:1-44 (Jan.) 1944

Frontiers of Multiple Sclerosis: I. Pneumoencephalography, Electroencephalography, Morbid Anatomy and Pathogenesis. W. Freeman.—p. 1.
*Canicola Fever (Leptospirosis Canicola): Report of Human Case and Review of Literature. G. Tievsky and B. G. Schaefer.—p. 11.
Problems of Neuropsychiatry in United States Army. R. D. Halloran.—p. 17.
Hospital and Administrative Problems in Wartime Civilian Medical Practice. M. T. MacEachern.—p. 24.

Canicola Fever (Leptospirosis Canicola).—According to Tievsky and Schaefer, infection of man with Leptospira canicola is a rarely reported occurrence. The condition occurs much more frequently than has been recognized. A Negro aged 23 was hospitalized with high fever. One week before admission he cut his foot with glass. The various tests and examinations made included agglutination tests with Leptospira icterohemorrhagiae and L. canicola. The titer was 100 times as high with L. canicola as with L. icterohemorrhagiae. The authors point out that canicola fever is transmitted through the urine of infected dogs. It has been shown that leptospiruria in dogs differs from the comparable situation in rats in that the latter continue to excrete leptospiras in the urine for the rest of their lives, while the former are shedders for only a limited period. The infection is perpetuated among dogs because of their habit of licking urine and intimate contact with genitalia. The disease in man results from the intimate contact with dogs in the stage of leptospiruria, the infection following the ingestion of contaminated material. There is probably a large canine reservoir in the United States with some potentiality for human infection. The authors stress the importance of doing agglutinations against both L. icterohemorrhagiae and L. canicola simultaneously because of the similar clinical picture resulting from infection with these organisms and the occurrence of a strong cross agglutination between them which may result in an erroneous diagnosis of Weil's disease.

Michigan State Medical Society Journal, Lansing

43:1-96 (Jan.) 1944

Certain Observations on Pains in Head of Intranasal Origin. H. I. Lillie.—p. 27.
Treatment of Open Fractures. K. Speed.—p. 33.
Tularemia: Case Report. E. F. Ducey.—p. 38.
Prognosis: Some Considerations. A. J. Baker.—p. 39.

Missouri State Medical Assn. Journal, St. Louis

41:1-24 (Jan.) 1944

Physiologic Problems of Burns. R. Elman.—p. 1.
Valvular Cholecystogastrostomy: Experimental Observations. J. M. McCaughan and H. K. Purcell.—p. 3.
Syphilis: Public Health Aspects. J. F. Bredeck.—p. 7.
Syphilis: Five Day and Other Treatments. A. W. Neilson.—p. 8.

41:25-48 (Feb.) 1944

Sulfonamides: Mode of Elimination. H. L. Barnett.—p. 25.
Id.: Use in Venereal Disease. W. S. Sewell.—p. 27.
Id.: Use of Sulfonamides in Army. M. G. Flannery.—p. 28.
Use of Sulfonamides in Army. A. C. Van Ravenswaay.—p. 29.
Diagnostic Features of First Pain of Acute Appendicitis. E. L. Keyes.—p. 30.

New England Journal of Medicine, Boston

230:1-30 (Jan. 6) 1944

Hodgkin's Disease: I. General Considerations. H. Jackson Jr. and F. Parker Jr.—p. 1.
Dental Needs of Massachusetts Children of Today. P. E. Boyle, W. R. Sisson, B. G. Bibby and Ruth L. White.—p. 9.
Phenarsine Hydrochloride in Treatment of Syphilis. W. P. Boardman and R. Kaldeck.—p. 12.
Differential Diagnosis of Chickenpox and Smallpox. C. Wesselhoeft.—p. 15.

230:31-62 (Jan. 13) 1944

How to Improve Treatment of Fractures. C. L. Scudder.—p. 31.
Diverticulitis of Colon: Review of Literature and Analysis of 91 Cases. E. L. Young and E. L. Young III.—p. 33.
*Transient Nervous Hypertension as Military Risk: Its Relation to Essential Hypertension. W. F. Rogers and R. S. Palmer.—p. 39.
Health Officer and Veterinarian. M. M. Kaplan.—p. 42.
Tuberculosis. J. D. Wassersug.—p. 45.

Transient Nervous Hypertension and Essential Hypertension.—Rogers and Palmer direct attention to transient elevations in blood pressure that are observed in men during physical examinations for the armed forces. During one month at the Office of Naval Officer Procurement, Boston, 222 (14 per cent) of 1,574 applicants had mild variable hypertension at the initial examination. The systolic pressure varied from 140 to 160 mm. and occasionally higher, and the diastolic pressure ranged from 95 to 110 and rarely as high as 120. About one third of the subjects have only systolic hypertension. Organic changes as judged by the history, physical examination and urine examination were absent. Transient nervous hypertension is evidence of a nervous pressor reaction and is often accompanied by one or more adrenergic manifestations, such as tachycardia, sweating, erection of hairs and disturbed rhythm. Persons with transient nervous hypertension have a somewhat more noticeable rise of the blood pressure in response to cold than do normal controls, but definitely less than do patients with definite but mild early hypertension. The familial predisposition to degenerative vascular disease of those with transient nervous hypertension appears less than in patients with definite essential hypertension. The prognosis of nervous hypertension as indicated by a long follow-up study of 25 cases regarding both mortality and morbidity before middle age is excellent.

Psychiatric Quarterly, Utica, N. Y.

18:1-176 (Jan.) 1944

Sudden "Exhaustive" Death in Excited Patients. N. R. Shulack.—p. 3.
*Use of Metrazol in Barbiturate Poisoning. S. Androp.—p. 13.
Prevention of Postconvulsive Asphyxia in Electric Shock Therapy. H. R. Haines.—p. 23.
Logorrhea. E. Bergler.—p. 26.
Rorschach Analysis of Psychotics Subjected to Neurosurgical Interruption of Thalamocortical Projections. G. W. Kisker.—p. 43.
Autonomy in Anxiety. D. E. Cameron.—p. 53.
Study of Women Psychopathic Personalities Requiring Hospitalization. R. J. Van Amberg.—p. 61.
Fluctuations in Mental Level of Schizophrenic Patients. A. I. Rabin. —p. 78.
Physiologic Concept of Hypoglycemia and Convulsive Therapy. M. Squires and S. J. Tillim.—p. 92.
"Spontaneous" Mental Cure. L. R. Wolberg.—p. 105.
Shock Therapy in Involutional and Manic-Depressive Psychoses. J. A. Bianchi and C. J. Chiarello.—p. 118.
Effects of Benzedrine Sulfate on Behavior of Psychopathic and Neurotic Juvenile Delinquents. S. R. Korey.—p. 127.
Folie à Trois—Psychosis of Association. S. R. Kesselsman.—p. 138.

Metrazol in Barbiturate Poisoning.—Androp reports the successful use and analeptic action of 30 cc. of metrazol in a case of poisoning with 102 grains (6.6 Gm.) of sodium amytal. The rationale for the use of metrazol is discussed and indications for its use are given.

Quarterly J. Studies on Alcohol, New Haven, Conn.

4:357-512 (Dec.) 1943

Chemical Steps in Metabolism of Alcohol by Brain in Vitro. J. G. Dewan.—p. 357.
Tunnel Vision. A. R. King.—p. 362.
Personality Study of Alcohol Addiction. C. C. Hewitt.—p. 368.
Primitive Intoxicants. E. M. Loeb.—p. 387.

Radiology, Syracuse, N. Y.

42:1-106 (Jan.) 1944

Bone Changes in Leprosy: Clinical and Roentgenologic Study of 505 Cases. G. H. Faget and A. Mayoral.—p. 1.
Absorptive Bone Changes in Leprosy. J. P. Cooney and E. H. Crosby. —p. 14.
Treatment of Retinoblastoma: Radiation Therapy Supplementing Surgical Treatment. G. M. Tice and E. J. Curran.—p. 20.
*Pitfalls to Be Avoided in Roentgen Diagnosis of Intracranial Disease. C. W. Schwartz.—p. 34.
Developmental Thinness of Parietal Bones. J. D. Camp and L. A. Nash.—p. 42
Roentgen Therapy of Pelvic Tuberculosis in Female. Harriet C. McIntosh.—p. 48.
Giant Cell Tumor of Lower Femur: Case Report with Roentgen and Pathologic Findings Before and After Curettage and Roentgen Therapy with Amputation for Sarcoma. F. B. Mandeville and J. S. Howe.—p. 56.
Tissue Changes Produced in C3H Mice by 50 Roentgen Whole Body Exposure. A. Nettleship.—p. 64.
Determination of Position of Calcium Deposits and Foreign Bodies from Stereoscopic Films Without Use of Viewing Stereoscope. S. Levi.—p. 71.

Pitfalls in Roentgen Diagnosis of Intracranial Disease.—After warning against drawing conclustions from inadequate films, Schwartz mentions among other factors the high incidence of a calcified pineal body and the estimation of its displacement. Another pitfall is the misinterpretation of an anomalous configuration and distribution of circulatory channels, particularly the diploic venous channels. The sutures are occasionally confusing. Convolutional impressions are often misinterpreted as evidence of intracranial pressure when in reality they are quite innocuous. Another frequent source of error in intracranial diagnosis is the misinterpretation of a demineralized sella turcica as evidence of pressure atrophy when actually it may be due to a congenital lack of bone calcium, to an abnormality of calcium metabolism of systemic origin or to a normally thin bone. This again emphasizes the importance of always considering the general physical status of the patient when interpreting roentgenographic changes. Symmetry of the skull is never perfect, so that we must be wary in interpreting asymmetry as abnormal. This is particularly true of the petrosa. From 10 to 15 per cent of skulls show congenitally asymmetrical petrous pyramids, one being aerated in a comparatively normal manner while the other contains very few air cells. The mistake must not be made of drawing conclusions from a study of only one part of the skull. Every structure must be carefully studied and evaluated with reference to the whole.

Surgery, St. Louis

15:1-210 (Jan.) 1944

Symposium on Plastic Surgery:
Planning Reconstruction. F. Smith.—p. 1.
Treatment of Battle Casualties and Street or Industrial Wounds of Face. V. P. Blair.—p. 16.
Early Treatment of Gunshot Wounds of Face and Jaws: Case Histories of Patients Treated During World War I. V. H. Kazanjian.—p. 22.
Some Deformities of Face and Their Correction. W. B. Davis.—p. 43.
Repair of Bony and Contour Deformities of Face. R. H. Ivy.—p. 56.
Evaluation of Pedicle Flaps versus Skin Grafts in Reconstruction of Surface Defects and Scar Contractures of Chin, Cheeks and Neck. G. Aufricht.—p. 75.
Vascular Prerequisites of Successful Skin Grafting: New Method for Immediate Determination of Adequacy of Circulation in Ulcers, Skin Grafts and Flaps. K. Lange.—p. 85.
*Fibrin Fixation of Skin Transplants. R. T. Tidrick and E. D. Warner. —p. 90.
Treatment of Burns and Other Extensive Wounds with Special Emphasis on Transparent Jacket System. Beverly Douglas.—p. 96.
Early Treatment of Burns. A. W. Farmer.—p. 144.
Repair of Burned Hand. G. W. Pierce, E. H. Klabunde and D. Emerson.—p. 153.
Plastic Repair of Extensor Hand Contractures Following Healed Deep Second Degree Burns. P. W. Greeley.—p. 173.
Rehabilitation Following Severe Burns: Experiences with Victims of Boston Night Club Fire. B. Cannon.—p. 178.
Free Transplantation of Nipples and Areolae. W. M. Adams.—p. 186.
Simplified Method of Rotating Skin and Mucous Membrane Flaps for Complete Reconstruction of Lower Lip. N. Owens.—p. 196.

Fibrin Fixation of Skin Transplants.—Tidrick and Warner employed fibrin fixation of skin transplants in 122 operations on 53 patients. There were three categories of wounds: (1) primary grafting procedures in which clean operative wounds have been grafted immediately, (2) burns and (3) other types of chronically infected granulating wounds. Fibrin fixation of tissue in operative procedures can be readily accomplished by the use of plasma and purified thrombin. Artificially supplied fibrin clots obtained in this manner proved to be of distinct mechanical aid in skin grafting operations. The results suggested that the fibrin also promotes healing, but additional data are needed for definite conclusions on this point. Thrombin in sterile and highly purified form is now available for clinical trial. The technic of fibrin fixation is simple and might be used to control the amount and site of deposition of fibrin in various types of operative procedures. Many possible applications suggest themselves. There have been no untoward results from the use of thrombin and plasma for fibrin fixation in the 122 operations in which the authors have used this technic.

Texas State Journal of Medicine, Fort Worth

39:461-508 (Jan.) 1944

*Aortic Hypoplasia: Report of 3 Cases. G. Werley, W. W. Waite and M. P. Kelsey.—p. 467.
Gastrointestinal Tract Malignancies. P. Brindley.—p. 470.
Subacute Bacterial Endocarditis: Report of Case. S. J. Lewis.—p. 472.
Incidence of Rheumatic Fever in Texas with Particular Reference to Dallas Area. Gladys J. Fashena.—p. 474.
Transplantation of Skin. T. H. Thomason.—p. 476.
Rupture of Fourth and Fifth Lumbar Disks with Bilateral Sciatic Pain: Report of Case. D. H. Echols.—p. 477.
Recent Developments in Hay Fever Therapy. E. E. Edmondson.—p. 479.

Aortic Hypoplasia.—Werley and his associates define aortic hypoplasia as that condition in which the lumen of the arterial vessels in the greater circulation remains abnormally small and the walls abnormally thin and elastic. In a series of 4,500 necropsies performed by the Department of Pathology of the University of Texas Medical Branch, aortic hypoplasia was recorded twenty-five times. Only 4 of the 25 cases showed cardiac enlargement. An extreme degree of aortic narrowness is probably required to produce heart disease, and it usually occurs only when there has been an excessive strain on the heart. Early heart failure may follow puberty, at which time the body in general grows more rapidly than the aorta. Increased elasticity at first somewhat compensates for aortic narrowness, but diminishing elasticity with age, even between 20 and 30 years, may explain the onset of failure among older patients. The rapid onset probably results from the limited reservoir of the small aorta causing dilatation of the already hypertrophied left ventricle. This may lead to a relative mitral insufficiency so that right heart failure appears early, as is seen in all 3 cases reported in this paper. The most important diagnostic method is fluoroscopy. The posteroanterior and left

anterior oblique views reveal best any changes in aortic size. If the aorta is small enough to cause heart failure a narrow aortic shadow and a small aortic arch and knob will be seen. The upper arch will be smaller than the pulmonic artery. There was no evidence of persistent thymus gland in the 3 patients seen by the authors. All had, in common, youth, vigorous exercise, brief duration, poor response to treatment and fatal outcome; necropsy revealed a small aorta, an enlarged and dilated heart with myocardial degeneration and fibrosis. Early recognition and discontinuance of strenuous exertion would no doubt greatly prolong life.

Urologic & Cutaneous Review, St. Louis

48:1-52 (Jan.) 1944

*Carcinoma of Prostate Gland: Analysis of 88 Fatal Cases from Charity Hospital of Louisiana at New Orleans, with Special Note on Newer Methods of Therapy. P. J. Kahle and H. T. Beacham.—p. 1.
Outline for Office Investigation of Sterility. E. W. Page and C. W. Page.—p. 11.
Role of Bladder in Gynecology. D. Lazarus.—p. 15.
New Concept of Gerontotherapy (Treatment of Aging Process). H. Benjamin.—p. 17.
Practical Treatment Management of Patient with Early Syphilis. H. Goodman.—p. 24.
Office Management of Syphilis of Long Standing. P. S. Carley.—p. 27.
Syphilis of Stomach. F. Cunha.—p. 32.
Perennial Problem of Syphilis with Special Reference to Its Neurologic Phase. M. H. Weinberg.—p. 39.
Epidermatomycosis of Feet and Hands. J. J. Barrock.—p. 43.

Carcinoma of Prostate Gland.—Kahle and Beacham studied 342 cases of carcinoma of the prostate treated at Charity Hospital of Louisiana over a four year period. A detailed study was made of the 88 cases (25.1 per cent) with a fatal outcome. Early diagnosis of prostatic carcinoma is difficult chiefly because the onset is insidious and the early clinical picture is obscure. Patients are seldom seen until their disease is far advanced. The causes of death of patients with carcinoma of the prostate are various and include, as well as the disease itself, chiefly urinary tract infection and degenerative diseases common to men of advancing years. Because of the status of many patients with carcinoma of the prostate gland, therapy usually must be directed chiefly toward the postponement of death and toward keeping the patient comfortable during the remainder of his life. Radical perineal prostatectomy is possible in only a minimal number of cases and is attended with a high mortality. Transurethral resection of the gland is the most practical operation for general purposes. The recent development of castration and of diethylstilbestrol therapy in the treatment of carcinoma of the prostate has permitted results not heretofore achieved with any other form of therapy. Neither method is curative, but both bring about in a large number of cases at least temporary improvement in the general status, relief from pain, regression of metastases and local regression of the malignant growth. The authors prefer diethylstilbestrol therapy for all patients to castration and regard it as more rational.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

52:1-40 (Jan.) 1944

Carcinoma of Uterine Cervix: Treatment and Prognosis. D. G. Morton.—p. 1.
Women in Heavy War Work: Obstetrical and Gynecological Aspects. G. C. Schauffler.—p. 12.
Course of Postoperative Parotitis Under Radiation Therapy. F. Buschke and S. T. Cantril.—p. 21.
Incidence, Treatment and Prevention of Hydatid Mole and Chorionepithelioma. Edna Myers Jeffreys and P. Graffagnino.—p. 29.
Oral Treatment of Ovarian Deficiency with Conjugated Estrogens-Equine. F. E. Harding.—p. 31.
Delusive Calm Following Jejunal Rupture by Nonpenetrating Abdominal Trauma. D. Metheny.—p. 34.

Yale Journal of Biology and Medicine, New Haven

16:217-266 (Jan.) 1944

Humanism in Medicine and Psychiatry. G. Zilboorg.—p. 217.
Approach to Use of Drugs in Hypothermia. H. G. Barbour, Elizabeth A. McKay and W. P. Griffith.—p. 231.
Effects of Morphine on Cortical Electrical Activity of Rat. R. L. Cahen and A. Wikler.—p. 239.
Hereditary Malocclusion: Case Report. B. G. Anderson.—p. 245.
Moon Madness. H. S. Burr.—p. 249.
Influence of Morphine on Tissue Permeability and the Spreading Effect of Hyaluronidase. R. L. Cahen and M. Granier.—p. 257.
Colostomy of Ascending Colon or Cecum. G. J. Connor and S. C. Harvey—p. 261.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Radiology, London

16:357-390 (Dec.) 1943

Peptic Ulceration of Esophagus with Partial Thoracic Stomach. A. S. Johnstone.—p. 357.
Malignant Tumors of Upper Jaw. B. W. Windeyer.—p. 362.
Investigations into Degree of Scattered Radiation Received by X-Ray Workers During Routine Diagnostic Examinations in a Military Hospital Department. J. A. C. Fleming.—p. 367.
Two Congenital Deformities of Tibia: Congenital Angulation and Congenital Pseudarthrosis. E. R. Williams.—p. 371.
Efficiency of Radiation and Homogeneity. E. M. Ungar.—p. 376.
Role of Inflammation in Induction of Cancer by X-Rays. H. Burrows and J. R. Clarkson.—p. 381.
Adenolymphoma of Parotid Salivary Gland. M. Lederman.—p. 383.
Hodgkin's Disease of Stomach. H. Jungmann.—p. 386.
Note on X-Ray Isodose Curves. W. V. Mayneord.—p. 388.

British Journal of Venereal Diseases, London

19:139-184 (Dec.) 1943

*Hyperthermia in Treatment of Resistant Gonococcal and Nonspecific Urethritis. A. J. King, D. I. Williams and C. S. Nicol.—p. 141.
*Physiologic and Biochemical Changes Following Hypertherm Treatment. J. Wallace and S. R. M. Bushby.—p. 155.
Nursing Aspect of Hyperthermy Treatment. Edith Pegg.—p. 166.
Venereal Disease in Pepys's Diary. J. D. Rolleston.—p. 169.
Ophthalmia Neonatorum. E. Assinder.—p. 173.

Hyperthermia in Resistant Gonococcic and Nonspecific Urethritis.—King and his associates used hyperthermia with the Kettering apparatus in resistant gonococcic and nonspecific urethritis. They tabulate the results obtained in 418 cases with sessions of fever at 106 F. with and without premedication with various sulfonamides. They conclude that high fever mechanically produced is the treatment of choice for resistant gonococcic urethritis. It is much more effective when combined with sulfonamide premedication. The duration of fever required varied with the individual case, but sessions of six to eight hours produced a high proportion of successes. Cases in which hyperthermia was not followed by immediate cure frequently responded to measures which had previously failed. Hyperthermia was less effective but still of value in the treatment of resistant cases of nonspecific urethritis. The advantages of premedication with sulfonamides were less effective in these cases. The potential dangers of this treatment can be reduced to a minimum by careful and skilful technic.

Physiologic and Biochemical Changes Following Hypertherm Treatment.—Wallace and Bushby point out that treatment which involves the maintenance of the body temperature at 106 F. for a period of eight hours imposes a severe strain on the vital organs. They investigated physiologic and clinical changes in patients undergoing hyperthermia treatment for gonorrhea. Clinical studies were made on 254 cases in which hyperthermia treatment was being given at 106 F. for eight hours. Thirty-seven of these cases have been the subject of a detailed clinical, hematologic and biochemical investigation. The most constant and prominent features have been the development of anoxia and bilirubinemia, progressing to manifest clinical jaundice in 37 cases. Hippuric acid tests showed a considerable reduction in liver function. Continuous oxygen and carbon dioxide therapy lessened but did not abolish anoxia. Administration of oxygen and carbon dioxide appeared to prevent the development of circulatory collapse. Vomiting was less frequent after the introduction of oxygen therapy. This complication of circulatory collapse is a failure of the vasomotor and respiratory centers and is not due to a reduction in the circulating blood volume or to myocardial failure. Morphine is absolutely contraindicated. There is a transient polymorphonuclear leukocytosis and a transient hemodilution. There is a small transient rise in nonprotein nitrogen and a tendency for plasma chlorides and urinary chlorides to fall. Premedication with 6 Gm. of sulfathiazole does not increase the hazards of this treatment. Indications for prehypertherm and posthypertherm treatment are given.

British Medical Journal, London

1:1-32 (Jan. 1) 1944

Nature of Concussion. G. Jefferson.—p. 1.
Nutritional Deficiency in Pathogenesis of Disease. J. Yudkin.—p. 5.
*Prisoner of War Mentality: Its Effect After Repatriation. P. H. Newman.—p. 8.
Case of Aspirin Poisoning. A. D. Charters.—p. 10.
Prostigmine in Treatment of Delayed Period. E. Friedmann.—p. 11.

Prisoner of War Mentality.—Newman states that the number of prisoners ultimately returning to Britain alone will be many hundreds of thousands and, that to countries throughout the world, millions. The return of these prisoners will entail a flooding of the country with men and some women who have experienced circumstances not necessarily harder but quite different from the majority of the others. The effects of internment are physical and mental. The treatment of the physical effects after release is probably a matter of good food, elementary medicine and pleasant conditions. In mental convalescence, common sense is the guiding principle. The use of individual psychologic treatment is debatable; it may carry with it a public acknowledgment of mental abnormality, which must at all costs be avoided. Barbed wire disease is a misnomer. It is wrongly called a disease and perhaps is better termed a mental attitude. This mental attitude is built up from four phases through which the average internee passes. Stage 1 is the breaking-in period, stage 2 the period of convalescence, stage 3 the lengthy period of boredom and stage 4 the repatriation period. The author lays emphasis on the importance of the typical mental reactions which follow release as opposed to those shown while in the camp. The great majority of returned prisoners of war do not give rise to concern, but those showing excessive mental reactions or an undue persistence of symptoms may need assistance.

Journal of Mental Science, London

89:363-482 (July-Oct.) 1943

Psychometric Study of Senility. H. Halstead.—p. 363.
Results of Shock Therapy Evaluated by Estimating Chances of Patients Remaining in Hospital Without Such Treatment. L. S. Penrose and W. B. Harr.—p. 374.
Malaria in Neurosyphilis 1923-1943. J. E. Nicole.—p. 381.
Rehabilitation of Neurotic. L. Minski.—p. 390.
Language and Its Relation to Perceptual and Conceptual Thought. E. L. Hutton.—p. 395.
Observations on Toe Flexor (Schrijver-Bernhard) and Toe Fanning Reflexes in Catatonic Schizophrenics. H. H. Fleishhacker.—p. 403.

Journal Obst. & Gynaec. of Brit. Empire, Manchester

50:393-464 (Dec.) 1943

Review of Problem of Purpura During Pregnancy. C. W. F. Burnett and I. Klass.—p. 393.
Blood Examinations in Pregnancy. Lilli Meyer-Wedell.—p. 405.
Neonatal Mortality. F. M. B. Allen, C. H. G. Macafee and J. H. Biggart.—p. 417.
Erythroblastosis and Congenital Syphilis in Newborn Infant. J. L. Henderson and Agnes R. MacGregor.—p. 427.
Nomenclature of Hormone-Producing Tumors of Ovary. H. Burrows.—p. 430.
Spinal Anaesthesia in Cases of Delivery by Obstetric Forceps. Ellen B. Cowan.—p. 433.
Onyalai: Tropical Condition Characterized by Hemorrhages: Its Gynecologic Aspects. B. Gilbert.—p. 437.
Fibroma of Ovary with Ascites and Hydrothorax. A. Gild.—p. 440.
Soap as Foreign Body in Bladder. C. A. Mawson and G. A. Zak.—p. 443.
Advantages and Disadvantages of Trial Labor. W. Hunter.—p. 445.
Case of Anuria Following Manual Removal of Placenta and Blood Transfusion with Subsequent Development of Irregular Heart Action Cured by Potassium Administration. R. A. E. Magee.—p. 448.

Journal of Royal Army Medical Corps, London

81:205-254 (Nov.) 1943

Experiences of an Administrative Medical Officer in Greece, 1941. D. T. M. Large.—p. 205.
Control of Malaria: East Africa Command, 1940-1943. D. B. Wilson and A. R. Melville.—p. 213.
Dyspepsia and Sick Parade: 141 Cases in an Armored Regiment. D. G. Aitken.—p. 223.
Compo-Cookery in Casualty Clearing Station. K. C. Pacey, J. R. Bleackley and W. R. Martine.—p. 231.
Simplified Method of Applying the Thomas Splint as a First Aid Measure. F. A. Bevan.—p. 244.
Regimental Treatment of Scabies. H. F. Lunn.—p. 247.
Remedial Exercises for Backache. T. G. Rankine.—p. 250.

Lancet, London

1:1-38 (Jan. 1) 1944

*Traumatic Arterial Spasm. S. M. Cohen.—p. 1.
Reactive Anxiety and Its Treatment. G. Garmany.—p. 7.
Controlled External Pressure and Edema Formation. R. J. Rossiter.—p. 9.
*Late Results of Perforated Peptic Ulcer. C. P. G. Wakeley.—p. 11.
Perforation of Gastric and Duodenal Ulcers: Series of 312 Cases. S. C. Raw.—p. 12.
Perforated Peptic Ulcer During Period of Heavy Air-Raids. C. C. Spicer, D. N. Stewart and D. M. De R. Winser.—p. 14.
Continuous Intravenous Adrenalin in Spinal Anesthesia for Control of Blood Pressure. F. Evans.—p. 15.
Unusual Case of Pellagra. T. L. C. Henderson.—p. 17.
Kala-Azar in an English Seaman. R. B. Thompson.—p. 17.

Traumatic Arterial Spasm.—In his Hunterian lecture Cohen presents a survey of arterial spasm based on 120 collected and personal arterial incidents in most of which spasm was a feature and an experience with air raid casualties running into four figures. The peculiar responses depend on the natural contractile properties of the smooth muscle of the arterial wall. The sympathetic system is not concerned in the local spasm of the main artery, but by keeping the cutaneous circulation closed the sympathetic system prevents the blood pooling in the relatively unimportant skin areas and so starving the muscles. Thus where the sympathetic fibers are destroyed, as in associated nerve injuries, the onset of a Volkmann lesion may be favored. The muscle circulation cannot be assessed from observation of the skin circulation. The operation of arteriectomy has no reflex effect in cases of arterial spasm; it may be of value, but purely for mechanical reasons, such as removal of a clot or of a contused segment of the vessel in which a clot is likely to form. A local arterial bruise does not by itself act as an irritant focus and maintain spasm: this was initiated by the original blow. Pulling on the distal half of a vessel during ligation or embolectomy may initiate a spasm lasting varying times. Venous trauma is unlikely to cause reflex arterial spasm. Hemorrhage from a divided vessel is checked by the spasm induced by the stimulus of the elastic recoil of the vessel. When this recoil is prevented, contraction is effective. Tourniquet spasm and the allied condition following crushing injury are of an entirely different type. They are a shock response for which nerve block and icing of the limb till the circulation is restored are advocated. In the arterial spasm following fracture early operation is needed. Repeated manipulations during the first forty-eight hours are to be avoided. Segmentary spasm is regarded as innocuous, but exploration is advisable because the state of the vessel cannot otherwise be determined. In the management of the anemic limb, elevation is important. The limb should be kept cool, not iced. Icing is reserved for the crushing injury. Spasm of the deep vessel is not induced by refrigeration of the limb. Attention to the patient's general condition is the primary consideration.

Late Results of Perforated Peptic Ulcer.—Wakeley states that since the bombing of Britain began there has been an increased incidence of perforated peptic ulcer in both sexes. This has been noticeable among civilians and the personnel of the fighting forces. The author investigated the late results of operation in naval personnel. A follow-up of 103 patients with perforated peptic ulcer operated on at a Royal Naval hospital between 1924 and 1934 showed that 44 per cent are still serving in the Royal Navy. The operative mortality was only 8 per cent, partly because the average interval between perforation and operation was only four hours and partly because the patients were relatively fit men of an average age of only 32 years. Hence the contrast with a control series of civilians in which the average age was 46, the average interval between perforation and operation ten hours and the mortality 20 per cent. The patient with a perforated peptic ulcer need not be invalided from the service, nor need a history of perforation necessarily mean refusal by recruitment medical boards.

Medical Journal of Australia, Sydney

2:453-472 (Dec. 4) 1943

Psychiatric Casualties in an Operational Zone in New Guinea. A. J. M. Sinclair.—p. 453.
Case of Hematemesis Treated by Indirect and Direct Blood Transfusion. J. A. McLean.—p. 461.

South African Medical Journal, Cape Town

17:343-358 (Nov. 27) 1943

*Causalgia in War Wounds. A. C. Copley.—p. 343.
Allergic Dermatitis from Footwear. A. Robins.—p. 345.
Intercondylar Dislocation of Patella. S. V. Humphries.—p. 347.

Causalgia in War Wounds.—Copley shows that causalgia is an intractable form of neuralgia, neither truly somatic nor exactly following the distribution of peripheral nerves. It is characterized by a peculiar burning type of pain. An affected limb is cool but pink, extremely sensitive to touch and minor irritations. Vascular instability is present. The pain is periodic in intensity and variable in distribution but may be of such severity as to demand morphine for relief. The primary cause is always nerve trauma, but the trauma may be trivial, transient or indirect, and it is a curious observation that a nerve which has been shaken or bruised more commonly sets up causalgia than one which has been completely divided. The author describes several case reports to illustrate this. Causalgia is clearly not a neuritis or inflammation of the normal channels of communication between receptor organs and the areas of appreciation in the brain. There is sufficient evidence to show that causalgia is a disease of the vasomotor nerve supply to the limbs either of the efferent or of the afferent fibers or of both. Causalgia is a peculiar reflex set up by the pain of trauma and bound up with the blood vessels. If it is accepted that causalgia is a fixed sympathetic reflex, it must be broken somewhere in its path. To produce lasting results in causalgia of the arm the stellate ganglions must be exposed and, in the leg, the lumbar ganglions.

Revista de Tuberculosis, Havana

7:403-500 (July-Sept.) 1943. **Partial Index**

Nontuberculous Pulmonary Lesions. E. Rivero.—p. 444.
*Complications of Extrapleural Pneumothorax. R. N. Boza Mesa.—p. 452.

Complications of Extrapleural Pneumothorax.—Boza Mesa reports 5 cases of gas embolism and an instance of pleural epilepsy complicating artificial extrapleural pneumothorax. A necropsy in 1 of the cases in which death resulted from cerebral gas embolism in the course of the insufflation of air revealed greatly diffused air bubbles in the arterioles of the cerebral convolutions. In the instance of pleural epilepsy two different attacks occurred. The insufflation of gas was immediately discontinued. The author emphasizes the danger of these complications, which constitute definite contraindications for further extrapleural insufflations.

Beiträge zur klinischen Chirurgie, Berlin

174:177-336 (March 3) 1943

Cysts of Lower End of Ureter. D. von Klimkó and A. Kálló.—p. 177.
Perforated Gastric and Duodenal Ulcers and Their Postoperative Complications. J. von Szeleczky.—p. 189.
*Diabetes Insipidus Caused by Gunshot Injury of Head. W. Lambrecht.—p. 214.
Gas Gangrene of the Face. W. Lambrecht.—p. 218.
Histologic Diagnostic Evaluation of Large Number of Surgical Specimens of Stomach and Duodenum, with Particular Attention to Ulcer Carcinoma. W. Herzog.—p. 221.
Surgery of Esophageal Diverticulum. U. Graff.—p. 244.
*Causalgia After War Injuries. Wanke.—p. 263.
Diagnosis and Treatment of Subphrenic Abscess, Particularly Its Transperitoneal Opening. K. Kindler.—p. 293.
*Incidence of Cutaneous Relapses After Operation of Cancer of Breast, with Particular Consideration of Use of Electric Knife and of Postoperative Roentgen Irradiation. Helene Rieks.—p. 307.
Early Diagnosis of Gastric Cancer. M. Weiser.—p. 327.

Diabetes Insipidus After Gunshot Injury of Head.—Lambrecht reports a gunshot injury of the head sustained by a soldier. The man felt extreme thirst. Roentgenoscopy revealed fractures of the coronoid process of the lower jaw bone on both sides. The sella turcica appeared normal, and there was no fracture at the cranial base. There was hardness of hearing and a positive Romberg sign. There was some involvement of the facial nerve on the right side. The rest of the cerebral nerves showed no impairment of function, and there were no motor or sensory disturbances of the trunk and the extremities. The patient drank 25 liters of water daily, but the administration of phenobarbital and of hypophysin gradually reduced the fluid intake to 4 liters in the course of four weeks. The author assumes that the missile in passing through caused considerable contusion of the adjoining parts of the brain, particularly the hypophysis and the diencephalon.

Causalgia After War Injuries.—Wanke defines causalgia as a pain syndrome with vasomotor and trophic sympathetic disturbances. The pain is elicited by tactile, thermic, sensory or psychic stimuli of subthreshold intensity. The patients have a morbid desire to lessen the pain by keeping the involved extremity moist. Some moisten all uncovered parts of the body. This condition originates in local injuries of the median, medianulnar or sciatic nerves. Even injuries of the soft parts in the regions innervated by these nerves may cause causalgia. In one case of causalgia with partial injury of the sciatic nerve microscopic examination disclosed an inflammatory process in the perivascular lymph channels and in the lymph spaces of the intraneural vessels. Microscopic studies of 10 neuromas of the sciatic, median or ulnar nerves disclosed no such changes. This explains not only the pathophysiologic disturbances of causalgia but also its long duration and its refractoriness to treatment, because the inflammation ascends intraneurally to the spinal cord. Cyanosis usually exists in the diseased limb. A spasm of the arterioles exists with subsequent stasis in the capillary system and in the venules. The resulting interference with the metabolism and the gas exchange induces absorption of toxic products, and this in turn maintains the lymphogenic perivascular inflammation of the intraneural vessels. This represents a vicious circle which can be interrupted only by intervention on the sympathetic. Resection of the sympathetic trunk of the cervicodorsal thoracic chain for the upper extremity and of the lumbosacral chain for the lower extremity is immediately effective as regards the pain and the vasomotor and vegetative trophic disturbances. Follow-up examination five months after operation revealed 1 failure among the author's 6 cases. Although the immediate effect of resection of the sympathetic trunk is quite impressive, the complete denervation of the involved member is advisable in order to avoid relapses. Conservative measures, such as Leriche's anesthesia of the stellate ganglion, should be tried first. The reported microscopic changes indicate that in chronic cases even interventions on the sympathetic will fail.

Cutaneous Relapses After Operation for Cancer of Breast.—Rieks attempted to determine whether cutaneous recurrences of mammary cancer are less frequent after operations with the electric knife than after operation with the scalpel. Gerlach had demonstrated the superiority of the electric knife on the basis of cases treated at the clinic in Breslau between 1928 and 1933. Rieks reinvestigated Gerlach's cases as well as a number of additional cases treated up to 1939. She found that cutting with the high frequency instrument did not contribute to a noticeable reduction in the cutaneous relapses but that the improved roentgen irradiation improved the surgical results, so that the number of cutaneous recurrences was decreased by one third. She thinks that carefully planned postoperative roentgen irradiation will lead to even better results. Electric cutting had the effect that the relapse-free period was prolonged from an average of nine to an average of fifteen months.

Zentralblatt für Chirurgie, Leipzig

69:1181-1220 (July 18) 1942

*Jejunal Ulcer and Gastrojejunocolic Fistula. H. von Haberer.—p. 1182.
Guiding Lines in Surgery of Bile Passages. G. Pototschnig.—p. 1190.
A Rare Postoperative Complication. R. Tölle.—p. 1202.
Permanent Cure of Primary Sarcoma of Stomach. I. Maack.—p. 1204.

Jejunal Ulcer and Gastrojejunocolic Fistula.—Gastrojejunocolic fistula is a grave complication of a jejunal peptic ulcer which requires a truly radical operation to overcome it. Von Haberer resects the stomach, including the pylorus and tissue beyond the gastrointestinal anastomosis if an operation for exclusion has preceded the condition, also the excluded part and the fistula bearing segment of the colon. He encountered 25 instances of gastrojejunocolic fistula after 241 radical operations for jejunal peptic ulcer. The incidence of jejunal peptic ulcer can be considerably reduced by avoiding gastroenterostomies, particularly the unnecessary ones, as well as all operations for exclusion.

Book Notices

Clinical Diagnosis by Laboratory Examinations. By John A. Kolmer, M.S., M.D., Dr.P.H., Professor of Medicine in the School of Medicine and the School of Dentistry of Temple University, Philadelphia. Cloth. Price, $8. Pp. 1,239, with 75 illustrations. New York & London: D. Appleton-Century Company, Inc., 1943.

From the prolific pen of Dr. Kolmer comes another book which will receive a hearty welcome from physicians, students and clinical pathologists. It is devoted principally to the interpretation of the findings of the laboratory and their application to the scientific practice of medicine. In the last three decades the laboratory has assumed a most important role in the diagnosis and treatment of disease not only in the hospital but also in private practice. While the clinical pathologist is frequently called on in consultation to evaluate the laboratory findings, the responsibility finally rests on the clinician, who not only supervises the collection of the specimen but must also correlate the results of the laboratory with the clinical data at the bedside or office. In this volume he will find useful information to guide him.

The work is divided into three parts. The first comprises the clinical interpretations of practically all the tests used in the laboratory, even those of hormones, vitamins and the allergic reactions. Under each chapter heading is a discussion of the underlying physiology as well as its bearing on the treatment. A most valuable feature running throughout the entire volume is the tables summarizing the contents of each chapter in concise wording which should prove a boon to the busy practitioner.

The second part is devoted to the practical application of laboratory examinations in clinical diagnosis and ranges over a large number of diseases, such as those of the blood and the urinary system, the venereal diseases, those of the digestive and cardiovascular systems, diseases of the respiratory tract, those of metabolism, and infectious diseases. Included are also diseases of vitamin deficiency and the endocrine glands. Considerable attention is devoted to the interpretation of serologic tests, particularly those in syphilis, which at times have plagued the pathologists as well as the clinicians. Due consideration is given to false positives and so-called biologic falsely positive reactions. Transfusion hazards and the Rh factor are adequately discussed. The intradermal tests are beautifully illustrated by colored plates. As the mode of collection of the specimen is of primary importance, the cooperation of the clinician is continually emphasized.

The third part deals with the technical procedures of the laboratory tests and comprises 134 pages of short descriptions of various examinations. They are not intended to replace the larger manuals but are inserted here for the convenience of students in medical technology who prefer to have the technic and the interpretation in the same volume. Among the newer tests are those for crystals of sulfonamide compounds in the urine, and the determination of the various sulfonamides in the blood.

The index is quite thorough, the boldface type indicating the important sections. There are a few typographic errors, probably unavoidable in a volume of this size. A bibliography, intentionally limited, is appended to each chapter.

Pathological Histology. By Robertson F. Ogilvie, M.D., F.R.C.P., Lecturer in Pathology and Assistant in Forensic Medicine, University of Edinburgh. Foreword by A. Murray Drennan, M.D., F.R.C.P., Professor of Pathology, University of Edinburgh. Second edition. Cloth. Price, $9. Pp. 411, with 235 photomicrographs in color. Baltimore: William Wood & Company. 1943.

The revised edition contains an increase of seventy-six pages and fifteen illustrations. The volume is unique in the content of so many color photomicrographs of histopathologic processes. Many improved pictures replace previous photographs and are presented in colors strikingly similar to the appearance under the microscope. Typical special staining reactions as well as pigment deposits and microchemical tests are well portrayed. The color reproductions, however, while excellent, lack the clear minute histologic detail that only black and white illustrations apparently can depict. The text portions are almost limited to short macroscopic and more detailed microscopic description of representative pathologic conditions that usually comprise the slides used in teaching students histopathology in the laboratory. In this way the book is meant to supplement the average textbook of pathology for the medical student. The first four chapters discuss and illustrate general pathology, the next two tumors and the remaining twelve the special pathology of various systems. The newly added chapter of ten pages on the integumentary system describes two unusual skin conditions and may well have been omitted. The chapters on the histopathology of the kidney, heart, blood and hemopoietic system are particularly instructive. This work can serve as a guide for assistants in the laboratory course of histopathology as well as a reference book for students. It should emphasize the great value of the use of modern Kodachromes in demonstrating cellular changes to students and to practitioners in the clinicopathologic conference.

Medical Parasitology and Zoology. By Ralph Welty Nauss, B.Sc., M.D., Dr.P.H., Assistant Professor of Public Health and Preventive Medicine, Cornell University Medical College, New York. Foreword by John C. Torrey, Ph.D. Cloth. Price, $6. Pp. 534, with 95 illustrations. New York & London: Paul B. Hoeber, Inc., 1944.

As indicated in the foreword and preface, this volume is designed primarily to meet the needs of second year medical students for laboratory, lecture and collateral information in the field of medical parasitology and zoology. On the whole this goal has been achieved, although the material is not always coordinated, at times is internally inconsistent and abounds in minor technical errors.

The subject is divided into four main sections and in addition contains a group of appendixes, a glossary, a bibliography and a subject index. In each main section, i. e. Protozoa, Parasitic Worms, Arthropods and Disease Transmission, and Poisonous and Venomous Forms, the disease-producing organism is first presented and then successively the epidemiology, pathogenesis, symptomatology, diagnosis, treatment, prognosis and prophylaxis of the disease are considered. The best presentations in the opinion of the reviewer are malaria, trichinosis, hookworms and hookworm infection, and venomous snakes.

Appendixes I-IX contain useful information in making laboratory diagnosis and in preparing material for class use. The glossary is probably too lengthy and too inclusive. The bibliography is divided into two parts, although the reviewer has been unable to discover the reason for this division.

Inaccuracies or inconsistencies of thought or statement include the following: (1) "amebic dysentery" is "characterized by a bloody mucoid diarrhea" (p. 25); (2) chiniofon, anayoden and yatren are referred to as different chemotherapeutics (p. 42); (3) the dosage of these antiamebic drugs is given as "3 or 4 enteric-coated 4-grain (0.25 Gm.) pills or tablets daily," rather than t. i. d. (p. 42); (4) there is no mention of diodoquin, while special emphasis is placed on the value of emetine bismuth iodide; (5) the seatworm (Enterobius vermicularis) is referred to as resulting from soil pollution (p. 139); (6) Echinococcus granulosus and Hymenolepis nana are considered as "food-infesting worms" (pp. 201, 206), and (7) Brill's disease and murine typhus are regarded as synonymous (p. 316).

There are several peculiar spellings and combinations of the technical names of etiologic agents of disease, viz. Taenias, saginata and solium; Wüchereria for Wuchereria and malaya for malayi. The section of arthropods is especially subject to criticism because of the numerous technical and orthographic errors in technical names.

Some information is not up to date, especially in the treatment of kala-azar, oxyuriasis, strongyloidiasis, Fasciolopsis buski infection and in the present day distribution of yellow fever and Aedes aegypti, the yellow fever transmitter.

There are numerous line and halftone illustrations and one beautiful color plate on the malaria parasites. A few of these are original. Some of the borrowed ones are inaccurate and others suffer from too great reduction or from second hand reproduction.

There is unquestionably a large amount of valuable material in this book, but it should not be placed in the hands of the medical student without first giving him a series of mimeographed sheets indicating the more serious errors. The reviewer looks forward to a second edition in which greater editorial care is exercised. The volume is well printed and has a pleasing format, but considerable paper could have been saved with more careful planning.

Medical Clinics on Bone Diseases: A Text and Atlas. By I. Snapper, M.D. Cloth. Price, $10.75. Pp. 225, with 30 plates. New York: Interscience Publishers, Inc., 1943.

This is a new English edition of the author's well known monograph on a selected group of degenerative bone diseases. It consists of chapters on Recklinghausen's disease, on hyperplasia of the parathyroid secondary to other diseases, on avitaminosis D including fetal, infantile, late rickets and osteomalacia, on Paget's disease of the bone, on the lipoid granulomatosis, on Gaucher's disease and on multiple myeloma. Earlier editions of the author's studies of degenerative bone diseases appeared in the Netherlands and in France in 1938. The chapter on hyperparathyroidism is introduced by the author with a clear and concise historical review. In this he demonstrates his ability to select the high points on the road of our advancing knowledge without being burdensome by overquotations. This same discernment is evident also in his introductory discussions on lipoid granulomatosis and other conditions, especially Paget's disease.

From the diagnostic point of view, one cannot fail to appreciate the section on differential diagnosis; this applies in particular to osteitis fibrosa, to Paget's disease, to myeloma and to carcinomatous metastases. Similar attention is given to the differentiation in osteoporosis and lipoid granulomatosis as well as to renal insufficiency and osteomalacia. There is ample documentation by minute and thorough case reports. The most attractive and instructive features of the book include the pathologic descriptions and the reproductions of histopathologic and x-ray photographs. Roentgenograms and photomicrographs are excellent. While the chapters on osteitis fibrosa, osteitis deformans and vitamin deficiency are the most important because of the frequency of occurrence, the author nonetheless has spent the same painstaking effort on the less extensive chapters on lipoid granulomatosis and xanthomatosis of the bone. All are given concise historical introductions, a clear presentation of the principal clinical symptoms and particularly thorough treatment of the pathologic features. For the pathologist as well as for the orthopedic surgeon, this book is of exquisite instructional value. An English edition of this work is most welcome.

Pathology and Therapy of Rheumatic Fever. By Leopold Lichtwitz, M.D. Foreword by William J. Maloney, M.D., LL.D., F.R.S., Consulting Neurologist to the City Hospital, New York City. Edited by Major William Chester, M.C. Cloth. Price, $4.75. Pp. 211, with 69 illustrations. New York: Grune & Stratton, Incorporated, 1944.

This is an interesting and unorthodox presentation of the pathology and therapy of rheumatic fever. In thirteen chapters are presented clinical and pathologic observations of rheumatic fever, rheumatic and nonrheumatic arthritis and certain related conditions. The last chapter is devoted to a consideration of therapeutic procedures in these various conditions. There are many excellent illustrations, and a short reference list appears at the end of each chapter. In his charmingly written historical foreword Dr. William J. Maloney gives an excellent summary of the main thesis of the monograph: "In it, Professor Lichtwitz has marshaled his scientific and clinical resources convincingly to present rheumatism as a manifestation of allergy. The antigens, to which he attributes the disease, are all foreign proteins of one sort or another. Some are as exogenous as horse sera; others are products of the proteolysis that tissues undergo when spent or damaged; and others, again, are metabolites of invading micro-organisms." There is much in this little book to stimulate the student of rheumatic fever, and it is certain to find many interested readers.

A Manual of Medical Parasitology. By Clay G. Huff, Professor of Parasitology, University of Chicago. Cloth. Price, $1.50. Pp. 88, with illustrations. Chicago: University of Chicago Press, 1943.

This is based on the required course in the Medical School of the University of Chicago. The author notes the current need for greater emphasis on this field in the curriculum of medical schools than has been accorded in the past. The war, the shrinkage in the time and distance relations with the rest of the world, the great expansion in travel and the resulting increase in the sources of parasitic infections all combine to increase the importance of this field. This textbook covers the commoner parasitic infections of man, the insect vectors of blood diseases and the microscopic, serologic and immunologic methods employed in their diagnosis. It deals with the pathology but not with the treatment of parasitic infections.

Manometric Methods as Applied to the Measurement of Cell Respiration and Other Processes. By Malcolm Dixon, Ph.D., Sc.D., F.R.S. With a foreword by Sir F. G. Hopkins, O.M., F.R.S. Second edition. Cloth. Price, $1.75. Pp. 155, with 20 illustrations. New York: Macmillan Company; Cambridge: University Press, 1943.

Dr. Dixon in this edition has assembled expertly and with authority the pertinent literature on manometric methods in the form of a handbook. Since these technics are now being widely used in biologic research and are being applied to an ever increasing variety of problems, this not too technical account is a distinct service not only to beginners who desire knowledge of the principles involved and errors to be guarded against but also to more advanced workers. Part I deals with the types of manometers. The theory, which can be followed by any one with a knowdge of the gas laws, is given in detail for the constant volume and differential types. Methods of calibration and other practical details are described. Part II gives in detail the methods for measuring respiration, including the direct method, the first method of Dickens and Simer, the indirect method of Warburg, the second method of Dickens and Simer, the method of Dixon and Keilin and micro methods. These are described in a logical sequence which reveals the advantages or shortcomings of each in particular problems and the need of new and better procedures. Theory, when indispensable to an understanding of the procedure, is clearly presented. Many practical details, some of which would certainly be overlooked by the novice, are mentioned whenever the author thought it expedient, and the necessity for many precautions is explained. A few pages on micro methods and some protocols from actual experiments complete the text. Research workers in the field of manometry will welcome this well written and most helpful laboratory manual.

The Dysenteric Disorders: The Diagnosis and Treatment of Dysentery, Sprue, Colitis and Other Diarrhoeas in General Practice. By Sir Philip Manson-Bahr C.M.G., D.S.O., M.D., Senior Physician to the Hospital for Tropical Diseases, Royal Albert Dock and Tilbury Hospitals, London. With an appendix by W. John Muggleton, M.S.M., F.I.M.L.T. Second edition. Fabrikold. Price, $10. Pp. 629, with 131 illustrations. Baltimore: William Wood & Company, 1943.

The second edition of this medical classic contains the many advances in etiology, diagnosis and treatment of the dysenteries and related disorders which have been developed in the years since the first (1939) edition. The introduction of sulfaguanidine in the treatment of bacillary dysentery is recorded. In view of the recent new light on the cause of the sprue syndrome and the relationship of this symptom complex to the steatorrheas and fat absorption a new chapter on pellagra has been inserted, a better understanding of the complexities of this nutritional disorder having shed much light on the group of diseases with which it has much in common. Mechanized warfare has changed the habits of men but it has in no way lessened the horrors of these diseases, which take a heavy toll of men in combat areas. This war will do much to spread these diseases abroad throughout the world; hence the value of this authoritative and comprehensive treatise in general practice. It is the outgrowth of many years of practical experience in field and hospital by one of the leaders in this important aspect of private practice, public health and preventive medicine.

Pasteurisation. By Harry Hill, F.R., San.I., A.M.I.S.E., F.S.I.A., Sanitary Inspector, Borough of Southgate. Fabrikoid. Price, 10s. Pp. 152. London: H. K. Lewis & Co., Ltd., 1943.

This volume is well written and the subject thoroughly covered. The writer is thoroughly familiar with his subject. The concise manner of treating the subject and the absence of burdensome, technical detail and statistics serve to make the volume valuable to health officers lacking special training in milk sanitation. The book merits a wide circulation, especially in communities where raw milk is sold. It should also prove suitable as a textbook in medical colleges and nursing schools. Health officers and legislatures are furnished with sound arguments as to the necessity for pasteurization of milk and milk products. The criticisms of opponents of pasteurization are effectively met. The writer's discussions with respect to modern methods of pasteurization of milk, equipment and plant design and the processing of special milk products are well presented. Although the volume treats with problems in England, this fact should render it no less valuable in this country, since the problems discussed are essentially the same.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

MERCURIAL DIURETICS IN NEPHRITIS

To the Editor:—**If mercurial diuretics can be safely used in the treatment of edema from chronic nephritis, could favorable kidney function tests, especially urea clearance, be considered as criteria?**

F. G. Scovel, M.D., Rochester, N. Y.

ANSWER.—It is doubtful whether mercurial diuretics can be used safely in chronic nephritis. The major indications for their administration are embarrassing accumulations of edema fluid or ascites due to nonrenal causes, such as hepatic cirrhosis, venous obstruction and/or cardiac incompetence. The edema of nephrosis is associated with damage to the convoluted tubules of the kidney; the mercurial diuretics operate largely through impairing the reabsorption of water by these elements, probably by local toxic effects on the tubule cells. Opinion as to the advisability of applying mercurial diuretics in cases of bilateral chronic renal disease is not unanimous. The concensus, however, is to the effect that it is not without hazard. Acute exacerbations of renal injury have been observed.

Favorable renal function test results are suggestive that the mercurial diuretics may be well tolerated. Probably the most useful single test in this connection is the concentration test. The concentration of the urine (specific gravity) is conditioned largely by the functional integrity of the convoluted tubules. Thus, a good response to relative dehydration—specific gravity 1.025 or higher in the Fishberg procedure (Fishberg, A. M.: *Arch. Int. Med.* **38**:259, 1926) is indicative of active tubule functioning. The urea clearance test, although, perhaps, more mathematically quantitative, is not as sensitive to early impairment.

There are many other therapeutic methods of attacking edema in chronic nephritis. If due to hypoproteinemia, as it often is, replacement of the depleted serum proteins is indicated. Plasma or whole blood transfusions are often immensely valuable. The xanthine diuretics and acidifying salts (ammonium nitrate, calcium chloride and so on) are often effective and safer than the mercurial diuretics, although the responses are not as dramatic. One must keep in mind that edema fluid is more than merely retained water; it is full of toxic metabolic débris. Too rapid mobilization of intercellular fluid and diuresis are often dangerously intoxicating to a patient already very sick. More gradual reduction is safer. Edema per se in the extremities and loose connective tissue of the body is relatively harmless. One may do more harm than good by concentrating attention on the symptoms and treating the disease rather than the patient who has the disease!

SILVERY LESION OF SKIN

To the Editor:—**For approximately a year one of our hospital employees has had a nonpruritic silvery white streaked lesion which resembles scar tissue over the anterior surfaces of the bony prominences of both clavicles. The lesion seems to be slowly spreading. This location would coincide with the neck line of her starched uniform. Would you kindly advise if starch will cause a lesion of this type. If not, what could be the etiology and what do you advise for treatment?**

M.D., South Dakota.

ANSWER.—A nonpruritic silvery white streaked lesion suggests several possibilities. By far the commonest of these is linear atrophy of the skin, seen commonly on the abdomen after childbirth. While it is usually thought of as resulting from stretching of the skin, it is also seen in those whose skin has not been subjected to this form of trauma. In many instances it has followed toxic conditions, such as typhoid, tuberculosis or syphilis. The lesions may occur anywhere on the trunk or limbs as narrow lines which are at first brownish or purplish red, later becoming silvery white, slightly depressed streaks which show cross wrinkling. No form of treatment will benefit them. They are scars. A good description may be found in the book by Ormsby and Montgomery (Diseases of the Skin, ed. 6, Philadelphia, Lea & Febiger, 1943, p. 492). Direct trauma, such as the rubbing of a starched uniform, is not usually considered important in their causation.

Morphea, localized scleroderma, is not rare and often occurs as band shaped lesions, ivory colored to pure white, often surrounded by a zone of violaceous color. These lesions may occur anywhere on the skin and are at first distinctly infiltrated, later becoming soft and atrophic. They may be slightly elevated or depressed or may be at skin level. Trauma is often suspected of influencing the localization of such lesions, so that the irritation caused by a stiffly starched garment might be of importance. Most commonly they are treated by the administration of thyroid or by roentgenotherapy but so often resolve spontaneously that it is difficult to be certain how much credit the treatment deserves. They may, however, resist all efforts for many months. Boardman (Scleroderma, *Arch. Dermt. & Syph.* **19**: 901, 1929) presents a good discussion of this disease.

There are 2 other remote possibilities. Lichen sclerosus et atrophicus is a rare disease of the skin, considered by Nomland (Lichen Sclerosus et Atrophicus [Hallopeau] and Related Cutaneous Atrophies, *Arch. Dermat. & Syph.* **21**:575 [April] 1930) as midway between lichen planus and scleroderma. It appears as light red papules, becoming silvery white with dark colored, depressed puncta, one or several on each papule. The surface is dry and harsh to the touch. While trauma plays an important part in the localization of the lesions of lichen planus, forming linear groups as a response to scratching, no such effect is evident in the rare atrophic disease. The patches are groups of discrete papules or macules in roughly round or oval form. This disease is much less amenable to treatment than is lichen planus.

Pseudoxanthoma elasticum is a rare disease of the skin often associated with angioid streaks of the retina. It occurs as yellowish papules in groups or lines, often on the neck. Recently Silvers and Wolfe (Pseudoxanthoma Elasticum with Angioid Streaks, *Arch. Dermat. & Syph.* **45**:1142 [June] 1942) have reported a case in which the lesions in the axilla were "chalk white." This also is a degenerative disease not amenable to treatment and important because of its retinal lesions, which often lead to blindness.

PROBABLE ATYPICAL THROMBOCYTOPENIA

To the Editor:—**A woman aged 38 has had attacks of acute bone necrosis, with the local manifestations of a bone infection but without the systemic symptoms that would accompany a true osteomyelitis. Two years ago following a right sacroiliac sprain there developed ecchymoses of the tissues overlying the joint. The joint was painful and swollen, but there was no systemic evidence of infection. The joint was opened, and a necrotic area the size of a quarter (24 mm.) was curetted. Convalescence was complete. One year later the process repeated itself in the tenth rib, left side, anteriorly. A section was resected and reported osteomyelitis. However, growth of bacteria was not obtained and the guinea pig inoculation was negative for tuberculosis. About six weeks ago the left elbow became swollen and discolored, with areas of ecchymosis around the entire joint. Pain and tenderness is severe. A cast was applied, and improvement was noted only to regress to an acute condition shortly after cast was removed. The past history includes cholecystectomy fifteen years ago and cystic mastitis twelve years ago, followed by postoperative hemorrhage. X-ray sterilization was done three years ago for severe menorrhagia and migraine. The migraine disappeared after the x-ray treatment. The patient has had the following medication for many months: 1. Weekly injections of estrogenic substance 10,000 units gradually reduced to 5,000 units. 2. Thirty grains (2 Gm.) of calcium lactate daily. 3. Ascorbic acid 100 mg. three times a day with intramuscular injections of a like amount twice weekly. 4. Adrenal cortex extract 1.5 cc. twice weekly. 5. Vitamin K 2 mg. with bile salts daily. Repeated x-ray examinations of the elbow involved have been negative for a pathologic condition of the bone; the urine is normal; the Wassermann reaction is negative; hemoglobin is 75 per cent; the red blood cell count is 3,790,000; the color index is 1; leukocytes number 8,450, with polymorphonuclear cells 69 per cent, eosinophils 1 per cent, basophils 2 per cent, monocytes 2 per cent and small lymphocytes 26 per cent. The bleeding time was 25 minutes, coagulation time was 8 minutes and blood platelets were 65,000. There was no retraction of clot after five and one-half hours. Is this a case of idiopathic thrombocytopenia and if so what is the best recommended treatment?**

Stanley P. Jones, M.D., Mattituck, L. I., N. Y.

ANSWER.—Idiopathic or essential thrombocytopenia rarely is associated with hemorrhages into isolated joints, soft tissues or bones. Purpura is almost a constant finding in thrombocytopenia. The symptoms in this case have occurred over a period of years. The lesions described may have been produced by hemorrhages into subcortical bone or into the joint. The symptoms and findings of thrombocytopenia include (1) purpura, (2) hemorrhage from slight traumas, (3) increased bleeding time, (4) normal coagulation time, (5) absence of clot retraction, (6) decreased capillary resistance, (7) decrease in blood platelets and (8) moderate decrease in hemoglobin or red cell count.

For the patient described several of the findings mentioned have been noted. These include hemorrhage into the tissues, increased bleeding time, normal coagulation time, absence of clot retraction, decrease in blood platelets and a mild secondary anemia. If cutaneous purpuric lesions were ever present they were either not recognized or the description of them was omitted. Although the case would have to be considered atypical, a diagnosis of chronic essential thrombocytopenia would

seem to be justified. If, in addition to the findings described, capillary resistance could be shown to be decreased and repeated examinations of the cutaneous surfaces of the bone should reveal at any time a purpuric rash, the diagnosis could be considered to be confirmed.

It would be advisable to ascertain with certainty that this patient has or has not been intermittently exposed to such toxic agents as benzene, arsenobenzene, quinine or sedormid. Any one of these drugs or chemicals may be the etiologic factor producing secondary thrombocytopenia.

Treatment of thrombocytopenia, in addition to the medication which this patient has already been receiving, might include an occasional blood transfusion, the injection of 20 cc. of the patient's own blood intramuscularly or the intramuscular injection of sterile milk.

The snake venom treatment has been reported both favorably and unfavorably. Moccasin venom is used in a dilution of 1:3,000. An intracutaneous wheal is first made to test for sensitivity, and this will usually be found to be positive. If, following the series of injections, the intracutaneous venom reaction becomes negative, the prognosis may be considered to be more favorable than if it remains positive. Four-tenths cc. of the described dilution of moccasin venom should be injected subcutaneously or intramuscularly twice the first week. The dosage can be increased 0.1 cc. each week until 1 cc. doses are given, provided there is no severe systemic reaction.

If the patient does not improve, and certainly if in spite of treatment the hemorrhagic symptoms become more pronounced, the removal of the spleen will be definitely indicated. About 75 per cent of patients with chronic thrombocytopenia subjected to this operation have made complete or symptomatic recoveries. On the other hand, splenectomy may be attended by severe hemorrhage, shock and death. Only the most highly skilled and trained abdominal surgeons should undertake the operation for removal of the spleen.

JAUNDICE, BAD TASTE IN MOUTH AND POSSIBLE CHEMICAL CAUSATION

To the Editor:—**A man aged 38, a construction worker who had never been seriously ill, began to cough a great deal in January 1943 and complained of frequent nausea. At the same time he noticed a peculiar taste in his mouth, which could not be influenced by any means. In February there developed pain in his right chest and he went to bed. The cough continued with the expectoration of "thin" mucus, and his general condition deteriorated to such an extent that he was unable to work. He complained then of frequent dizziness and faint spells. He had lost by that time some 30 pounds (13.6 Kg.). After he had gone to bed in February a yellow discoloration of the skin which had been noticed by his friends became more intense. Three weeks thereafter he reports that his gums became dark, almost black, his teeth became brittle after they became "dull" during the early part of his illness, and eventually all his teeth broke off and had to be entirely removed. Eventually the general condition improved, and the patient was able to return to work in June, but up to this time he complained of weakness and soreness in his mouth. The objective findings are essentially negative except swelling and small vesicles of the gingiva. Throughout his illness the patient had not lost the peculiar taste mentioned. In June he discovered accidentally an agent which had the identical taste as that which had bothered him throughout these months, and he found that it was sodium hypochlorite, which was used on his job for sterilizing water containers. The question is now whether this agent could be held responsible for the symptoms of the patient and also whether his illness can be accepted as an industrial accident covered by workmen's compensation.**

Gerhard Kersten, M.D., Lycoming, N. Y.

ANSWER.—Many patients with disease states resulting in jaundice complain of persistent abnormal tastes. Any substantial injury from hypochlorite in other than large quantities is almost wholly ruled out through the fact that many hundreds of thousands of soldiers for many years have consumed water treated with such chemicals, and many millions of persons have consumed milk and other foods in contact with utensils and equipment disinfected with hypochlorites and not always under conditions scrupulously accurate as to the quantities of chemicals utilized. Hypochlorites are well known skin irritants in such places as the photographic laboratory and the operating room, in the latter of which hypochlorite solution above 0.5 per cent if used for surgical disinfection may induce skin injury. Lately hypochlorites have been associated with the cause of a minor condition popularly known as "angel eyes," leading to abnormal vision. All considered, no allegation that sodium hypochlorite brought about the condition described in the query may be regarded as substantiated by the facts so far furnished.

The rapid destruction of the teeth suggests the possibility of phosphorus poisoning; the black discoloration of the gums suggests bismuth poisoning or more remotely mercurialism. The key to this case probably is to be found in the type of hepatic disease leading to jaundice. However, the data furnished are wholly inadequate for the determination of the nature of the jaundice. Without listing the missing essentials, it is apparent that accurate appraisal either of the liver condition or of the chest condition cannot be made.

RECURRENT ATTACKS OF TONIC SPASM

To the Editor:—**A boy aged 3½ years was brought to me April 21, 1943 about 7:30 a. m. one hour after his parents had found him in a stupor, his jaws set and his limbs rigid. About thirty minutes before they discovered this condition he had wakened from an apparently normal sleep and had asked for a drink. Before it could be obtained he had dropped off to sleep. He had been perfectly well the day before and had had no previous attacks of any serious illness. After bathing the patient in warm water for ten minutes without any improvement they took him to the hospital. Examination showed that the temperature was 94 F. (checked four times with two thermometers), pulse rate 72, respiratory rate 20. The skin was slightly pale and cold but was dry. He lay quiet and when moved he would moan as if in pain. His eyes were kept shut most of the time. On being opened they rolled up and from side to side and had a glassy stare. The pupils measured 4 mm. and reacted to light. The jaws could not be opened. There was no frothing or bleeding at the mouth. There was no opisthotonos, but there was resistance to flexion of the neck. Both upper extremities were held in rigid flexion. The back and legs were less rigid, but movement was resisted. Examination of the heart, lungs and abdomen was essentially negative. A spinal tap showed water clear fluid and no increased pressure. No protein or cells were found in the laboratory. The only treatment given was application of external heat. In four hours the temperature was normal and the patient began to relax and regain consciousness. By six hours he was taking fluid eagerly and his rigidity and trismus were gone. His stupor gradually left, and in forty-eight hours he was apparently normal. A physical examination at the office six weeks later was essentially negative. On August 14 he had a second attack, similar in every way including the time of day, except that recovery was more rapid. On October 25 he had a third attack, similar in every way except that there was some frothing at the mouth and some clonic movements interrupting the rigidity. This patient is the tenth child in a family of eleven. He has been perfectly well except for these attacks. His diet is average including more than 3 pints of milk daily. There is no history of head injury. There is no known epilepsy in the family. What diagnoses other than epilepsy would you entertain? In what conditions might one find such a low rectal temperature? What studies or treatment would you advise?**

M.D., Idaho.

ANSWER.—The case is too complicated and presents so many factors that cannot be explained from the history that exact diagnosis is not justified. Epilepsy might be considered in view of the clonic movements with rigidity and frothing of the mouth noticed on the third attack. The other two attacks, however, are not so characteristic of this disease. The tonic spasm described in the first two spells with setting of the jaw and rigidity of all the limbs, plus the low temperature, suggests a lesion in the region of the hypothalamic centers with a condition known in laboratory animals as "decerebrate rigidity." This is occasionally seen in patients with brain tumors, particularly suprasellar cysts or in hydrocephalus and is a somewhat similar condition to that described by Wilson in 1920. The case here described varies from typical decerebrate rigidity in the flexion instead of the extension of the arms. When rigidity is intense, it is difficult to bring out the tonic reflexes described by Magnus and deKleyn.

The patient requires extensive study. Electroencephalograms should be done and possibly a ventriculogram. These studies can best be carried out in a large center where there is a fully equipped neurologic clinic.

References:

Wilson, S. A. K.: On Decerebrate Rigidity in Man and the Occurrence of Tonic Fits, *Brain* **43:** 220 (Nov.) 1920.

Davis, L. E.: Decerebrate Rigidity in Man, *Arch. Neurol. & Psychiat.* **13:** 569 (May) 1925.

Fulton, J. F.: Physiology of the Nervous System, ed. 2, Oxford University Press, 1943.

PANNICULITIS RESEMBLING SCLERODERMA

To the Editor:—**Does an active panniculitis develop in lesions of scleroderma? Is it possible for a chronic localized form of panniculitis to undergo secondary sclerosis with the development of a scleroderma-like condition?**

Samuel Irgang, M.D., New York.

ANSWER.—There are several reports of cases of nodular, nonsuppurating panniculitis which at some part of their course resembled morphea.

References:

Gilchrist, T. C., and Ketron, L. W.: A Unique Case of Atrophy of the Fatty Layer of the Skin Preceded by the Ingestion of the Fat by Large Phagocytic Cells—Macrophages, *Bull. Johns Hopkins Hosp.* **27:** 291 (Oct.) 1916.

Hazel, Onis George, and Lamb, John: Primary Panniculitis Afebrile in Type and Associated with Sclerodermatous-like Changes, *J. Oklahoma State M. A.* **33:** 1 (Jan.) 1940.

Miller, J. L., and Kritzler, R. A.: Nodular Nonsuppurative Panniculitis, *Arch. Dermat. & Syph.* **47:** 82 (Jan.) 1943.